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INTRODUCTION

The Fall 2002 meeting of Project LINK was held in Bologna, Italy from the 7 to 11 October 2002, hosted by Prometeia along with the Department of Economics, University of Bologna. More than 110 participants from over 50 countries and several international institutions attended the meeting. The agenda of the meeting comprised three broad sections: economic outlook, economic policy issues, and econometric techniques. This report summarizes presentations and discussions during the meeting.

The LINK *Global Economic Outlook* prepared by Economic Assessment and Outlook Branch for the meeting, the LINK *Country Report* prepared by country participants, and most of the other documents presented at the meeting are available on both the United Nations website (http://www.un.org/esa/analysis.link) and the Project LINK Research Centre website at the Institute for Policy Analysis at the University of Toronto (http://www.chass.utoronto.ca/ link). The deliberations held during the LINK meeting on the global and regional economic outlook will be used as background material for the forthcoming *World Economic Situation and Prospects 2003*, prepared by the United Nations Secretariat, available in early 2003.

On the morning of October 7, Professor Pier Ugo Calzolari, the Rector of the University of Bologna, gave delegates a welcoming oration, noting the various achievements of Project LINK over its more than three decades of operation. Professor Bert Hickman responded on behalf of its delegates, expressing appreciation for Professor Calzolari's sincere welcome and the hard work that the Italian hosts had evidently put into the meeting.

1. WORLD ECONOMIC OUTLOOK

Global Outlook

Experts from three international institutions, two universities, and an independent economic research organisation, presented their global economic outlooks to the meeting.

Jozef van Brabant of the United Nations presented the LINK Global Economic Outlook.[1] The outlook was prepared with inputs from national LINK centres and information from other sources before the meeting, based on simulation of the LINK econometric modelling system.

He stated that the world economy had been undergoing a gradual recovery from the sharp global slowdown of 2001, but neither the strength nor the breadth of the upturn were satisfactory, with the sustainability of the ongoing recovery subject to a number of uncertainties. Compared with the LINK forecast of Spring 2002, he believed that the peak of economic recovery would be delayed by at least two quarters, arriving around mid-2003 rather than in the second half of 2002 as suggested in the April forecast.

[1] The report is on the website http://www.un.org/esa/analysis/link/1002GlobOutlook.pdf

He pointed out a number of common features shared by many economies in the second part of 2002, such as slow growth of output, benign inflation—and even deflation in some economies—stagnant employment, low interest rates, worsening fiscal balances, unstable and uneven international trade, and gyrating and depressed equity markets. He also noted diverging economic performances across regions and countries, and the dependency of the recovery in many economies on the economic health of the United States, which seemed to have become the sole locomotive of global economic growth in recent years.

In analysing the underlying forces for the world economy, Mr. van Brabant mentioned three major positive factors, including policy stimuli, resilient consumer spending and inventory restocking. However, he also listed a number of adverse factors such as tepid business capital spending, protracted consolidation in global information and communication technology (ICT), deflated equity prices, and rising geopolitical tensions. He believed that the weakness in the global economy was principally due to the problem of excess investment in a number of developed economies in the late 1990s. He further elaborated that, as a result of the global weak demand, many developing countries with a high external debt burden had experienced either pressure on their exchange rates when adhering to a fixed-rate regime or weaker exchange rates when adopting a floating-rate regime, and deteriorating debt-to-GDP ratios. Especially vulnerable in his view had been countries with large current-account and fiscal deficits. The diminution in capital inflows into these countries necessitated a contraction in economic activity, which in turn entailed a deterioration in the fiscal outlook, eroded investor confidence, and led to further shrinkage in capital flows and a rise in the cost of external financing. He pointed out that a number of economies in Latin America were mired in such a vicious cycle in 2002, and remained quite vulnerable.

In the LINK outlook Mr. van Brabant presented, the economy of the United States is forecast to continue to lead the global recovery. Economic recovery in Japan and Western Europe remains reliant chiefly on external demand; with domestic demand lacking vigour, recovery in these economies would remain fragile. While the economy of Japan continued to be dragged down by fiscal and debt difficulties, most economies in Western Europe should be tightly constrained, on both fiscal and monetary fronts, by their adopted policy frameworks, thus leaving little scope for expansionary macroeconomic policies. He believed the economic rebound in several Asian developing economies would continue, but will remain vulnerable to any lapse in the pace of economic recovery in the major developed economies. On average, GDP for Latin America is expected to decline in 2002 and the outlook for 2003 remains cautious. While an increasing number of countries in Africa are expected to grow by 4 per cent or higher, due mainly to strengthened domestic economic factors, many economies in the region are not expected to achieve any tangible growth in per capita income.

Finally, Mr. van Brabant addressed a number of key downside risks for the global economic outlook, including mounting geopolitical tensions and the rise in deflationary pressures due to the protracted decline in equity prices. He suggested that in such an inauspicious environment, macroeconomic policies should remain accommodative; however, he implied that the current stance on economic stimuli might well fail to be sufficiently strong.

Table 1. Forecasts for World Economic Growth and International Trade, 2002-2004
(Annual Percentage Change)

	October, 2002 Forecasts [a]		
	2002	2003	2004
Gross World Product	1.7	2.9	3.5
Developed Market Economies	1.3	2.3	3.0
Developing Countries	3.3	4.7	5.1
Latin America and the Caribbean	-0.9	2.8	4.0
North Africa	1.9	4.1	4.6
Sub-Saharan Africa (excl. South Africa)	4.1	4.9	4.8
South and East Asia	4.4	5.0	5.1
China	7.7	7.5	7.6
Western Asia	1.9	4.4	4.9
Economies in Transition	3.4	4.0	5.0
World Export Volume	1.6	5.7	6.2

Source: Economic Assessment and Outlook Branch of the Development Policy Analysis Division of the United Nations Secretariat

[a] Pre-meeting forecasts

Mr. Hans Timmer of the World Bank presented his views on the global economic prospects, based on a forecasting exercise the Bank conducted in August 2002. Mr. Timmer commented that the growth rates forecast by the World Bank were only marginally different from those of the LINK outlook. Further, he emphasized the stringent conditions in global financial markets, which he believed might jeopardise the ongoing world economic recovery. He enumerated a list of weaknesses in the global financial sector: large external-account imbalances across developed economies, high levels of bad loans in Japan, large scale financial scandals in the United States, and the vulnerability of many financial institutions in Europe due to their exposure to the United States and Latin America.

In reviewing the latest trends in the world economy, he noted out that the recovery had been less uniform across countries than had been earlier expected. Therefore, the recovery's strength was less robust and many economies were more vulnerable to shocks: the probability of isolated economic crisis had increased, a global "double dip" could not be excluded, and a surge in the prices of oil would be harmful for many economies.

Mr. Timmer expressed concerns about the conditions facing many developing economies, as weak demand from developed economies would imply weak exports and low prices of non-oil commodities for many developing countries. He emphasized the pro-cyclical nature of private capital flows, calling for policies to foster "sound" (and stable) foreign direct investment and to enhance risk management in developing countries. He also pointed out a few bright spots in the generally weak global economy, such as the

relatively robust trade growth of China and a number of economies in Central and Eastern Europe, and the reorientation of external financing in many developing countries from debt to equity.

Mr. Pete Richardson of the Organisation of Economic Cooperation and Development (OECD) presented the outlook for the group of OECD members. His presentation was based on OECD Economic Outlook Number 71 released in mid-2002, with an update taking into account the most recent developments. Mr. Richardson stated that the recovery was differentiated across OECD countries, with the United States, driven by policy stimuli, leading the upturn. He noticed that most economies in the Euro area were lagging, as confidence remained weak and the European Central Bank (ECB) was confronted with more persistent inflation pressures and was therefore less forceful in its monetary easing. He believed that the tentative recovery in Japan had mainly been driven by exports, with domestic demand remaining weak, aggravated by rising public debts and increasing unemployment.

Mr. Richardson warned that further weakness in stock markets, as shown in September 2002, would delay investment spending in many developed economies, and the negative wealth effects of this weakness on consumers would also be increasing. He also mentioned some growing uncertainties in the global economy, including the tension between the United States and Iraq, and the risk associated with large external account deficits in the United States. He foresaw growth at less than potential for many developed economies until 2004.

Mr. Ray Barrell of the National Institute for Economic and Social Research (United Kingdom) provided the conference with an overview of the projections made from his institute. He separated his presentation into several key areas, and discussed the methodology by which NIESR makes forecasts and simulations.

He warned that the significant recent falls in equity prices and their dampening effect on demand would have a potential to reduce growth rates. It is estimated that a further 50 percent fall in equity prices in the most developed countries could bring growth to a halt. The effect on growth will eventually depend on the linkages between equity markets and investment in the OECD countries. He also presented a simulation on an increase in risk premia in United States and Euro markets (of about 2-3 percent), resulting in a fall in prices of equity in the order of 10 percent. The impact ultimately depends on the magnitude of the mark-up over the user (firm) cost of capital. The impact obtained on output growth is a loss of 0.33 percent in the first year in the US, a more limited 0.1 percent fall in the Euro Area, and a 0.33 percent fall in the UK, which is of the same magnitude as in the US due to stronger ties in terms of financial wealth. The simulation also foresees a depreciation of the US dollar vs. the Euro.

He mentioned that contagion via an impact on investment was ruled out, the impact being only via wealth effects. If an impact on investment is factored in as a result of the increase in risk premia, the impact is larger. In this case Germany would be particularly hit,

due to its economy's higher intensity in manufacturing investment, in both trade and output.

He claimed that the impact of the "Enron phenomenon" on equity prices would probably be larger than the impact had by the terrorist attacks of September 11, 2001.

He noted that long-term interest rates in the United States were lower, but corporate bond spreads widened. Short rates are stable, rather than on an upward trend. Real interest rates in the United States are probably around zero per cent now, which limits the ability for the Federal Reserve to further spur growth via monetary measures. Long term rates in the Euro Zone have weakened less markedly than in the United States, whereas short rates have tended to decline and are anticipated to continue doing so in the near future. Inflation is expected to decline in the outlook.

The US dollar / Euro rate had shifted by about 10 percent since the July outlook, but he believed that the Euro still looked relatively weak in terms of real effective exchange rates. Whereas the Euro has generally tended to strengthen, the US dollar has not generally weakened taking into account all trading partners.

In his view, the effects of an appreciation of the Euro would be a mark-down of Euro Area growth by 1 percent a year, for 3 years, followed by a return to trend growth. Inflation would be lower by between 0.8 and 1.0 percentage points a year. Euro equity prices would ease by about 5 percent in line with falling general prices. Euro Area inflation is currently lower than 2.5 percent, with German inflation below the average and falling markedly.

He stated that the effect of an oil price hike on the world economy would be small, and would depend on the monetary response. The impact of the currently higher oil prices on output growth is estimated at minus 0.1 percentage points. The negative effect on equity prices is also marginal.

He commented that OECD countries would have an investment problem: risk premia have risen due to corporate developments in the United States. *Enronisation*, which has affected equity prices and growth prospects more than expected, is the main phenomenon currently occurring. Meanwhile, in some countries, particularly Germany, the Basel II capital requirement accords will raise the cost of borrowing from banks, as it will introduce important changes in current lending practices. Consequently, bank lending is expected to become more constrained in almost all OECD countries.

In his opinion, fiscal policy would be proving to have a weak impact, with multipliers estimated at about 1.0. With the Stability and Growth Pact, there is little room for fiscal action in Europe. There isn't significant scope for monetary easing either, particularly in the United States. As a conclusion, there is little to be done on both sides of the Atlantic in terms of fiscal or monetary impulses.

Regional Projections

Peter Pauly (the University of Toronto), presented the outlook for *Western Europe*. He noted that while there was disparate performance within the region, generally speaking, output gaps were increasing in many countries and forecasts were being revised downwards. Economic performance in Germany and Italy appears particularly pessimistic, while the United Kingdom, France, Spain, Greece and Scandinavia remain relatively stronger. Still, the overall outlook is fragile, and given that intra-European trade remains strong, economic weaknesses result primarily from lacklustre domestic demand. Despite this blanket concern, Mr. Pauly reiterated there are significant disparities across countries, particularly in differentiated fiscal positions and structural labour situations.

In addition to the weak economic situation, there is little room for ameliorative policy action. Although there is still room for short term rates to be brought down, the ECB is constrained because inflation is above the 2 per cent upper bound of its target. The framework also allows little possibility for the ECB to respond to the difficulties in a single country. On the fiscal front, the Stability and Growth Pact provides scant flexibility for fiscal stimuli.

The result of these factors is that 2002 is expected to be weak, with growth picking up in 2003 and 2004, approaching its potential of about 2.5 per cent. Inflation will slowly decelerate to below 2 per cent while unemployment will remain high. Germany and Italy will remain weak in the near term, while the United Kingdom and France have stronger outlooks. Of the smaller economies, Greece and Ireland have healthy forecast, but many others are less robust.

With an average rate of 2 per cent, inflation has varied widely across Europe, ranging from a low of 1.5 per cent in Germany, to 3.5-4 per cent in Ireland. Unemployment also showed significant variation, with Germany and France in the 8-9 per cent range and Spain at 10 per cent, while Ireland and the United Kingdom are the midrange, and the Netherlands, Switzerland and Norway at the lower end of the spectrum.

Mr. Pauly concluded his presentation with a delineation of some issues that he believes would largely impact the speed and scope of Europe's recovery: European economic fortunes depend heavily on German performance, how the ECB manages the balance between stability and stimulus, what consequences would face those counties that breached the 3 per cent deficit limit (he believes no penalties would be applied), how the preparations for accession of new countries into the EU fare—especially in terms of macroeconomic and structural issues, how the process of structural reform progresses in Germany, and, finally, how the CAP fares in face of the negotiations under the Doha round.

Franjo Štiblar (University of Ljublijana), presented the outlook for *Eastern and Central Europe.* He noted that as you moved in Europe from west to east growth became stronger. This was due to the weak performance of Western Europe, depressing growth in those countries most tied to the west while those countries more closely tied to the former

Soviet Union were boosted by its relatively more robust performance. Recently, growth has been decelerating but not significantly. Consumption and government spending were supporting growth, unemployment was high, and inflation was low.

He mentioned that there were a number of positive factors in the region: restructuring has continued; inflation has been generally declining—with only two countries experienced what is expected to be only a temporary increase; and, interest rates have been declining in the region, helped by competition amongst banks.

However there were also less positive factors. Unemployment was still high and there was no obvious downward trend. Much of this is thought to be of a structural nature. Current account deficits were in the 4-5 per cent of GDP and rising. Exports had declined significantly but imports had declined by less, so that net exports had fallen. The introduction of the euro had led to an inflow of FDI, resulting in a real appreciation of domestic currencies. Finally, budget deficits had increased.

Restructuring was accelerating as eight countries were in accession negotiations with the EU, while seven countries were in similar negotiations with NATO. What would entry into the EMU mean? A major question remains the uncertain availability of funds through the CAP and structural funds. Funds were not expected to be generous at first; the Czechs may even be a net contributor. It could be that while the eight countries would no longer be a separate region, they could become part of a two-tiered EU. Other impacts would come from the necessary liberalization and restructuring. So far capital markets have already been liberalized. However, labour markets have not been and it would take another fifteen years until they would be. Meanwhile, trade liberalization remains incomplete.

His forecast for the region was for growth in the 3-4 per cent range, forcing unemployment down marginally. Inflation will also decline slowly, and real currency appreciation will continue. Both current account and government budget deficits should narrow, with monetary and fiscal policy becoming increasingly tight. Poland is crucial to this outlook, as it is a leading country. Major policy issues will be prioritising goals such as growth or stability in the context of structural reforms.

Professor Lawrence Klein (University of Pennsylvania) presented the outlook for the economy of *the United States*. He began with a comment that the economy of the United States was not the sole locomotive for the world economy (contrary to what many other analysts argued), but rather that the economy of the United States is a good litmus test for the economic conditions pertaining in many other countries. He also remarked that too much attention might have been paid to the fluctuations in financial markets, which had been erratically volatile in the past year or two, and he believed that more attention should be paid to the "real" economy.

In analysing the United States economy, he started with its sources of strength. Consumer spending had been growing steadily at a pace of about 3 per cent, reflected in the strong sales of cars and home appliances. He also noted that gains in productivity from

the late 1990s seemed to be lasting, which was crucial in holding down inflation. The problem was, however, that so far neither the strong consumer spending nor the gains in productivity had benefited corporate profits—strong sales of durables were boosted largely by deep discounts and zero-financing plans. He then addressed a number of weaknesses in the economy, including declined equity prices, weak business investment, large deficits in trade and current accounts, and accounting problems. He also remarked that, although wage levels had been rising, the pace was not rapid. He labelled the recovery so far as a "jobless recovery," as the unemployment rate had stagnated and the number of long-term unemployed people (those in the queue for 27 weeks or longer) was at high level.

Commenting on monetary policy, he stated that the Federal Reserve of the United States had cut policy interest rates rapidly, but the long-run interest rates in capital markets did not follow in tandem and stayed at a relatively high level for a long period in the past year.

In the outlook, he believed that the economy of the United States would grow at an average rate of about 3 per cent in 2002-2003.

In the discussion, Professor Bert Hickman of Stanford University commented that low interest rates seemed to be ineffective to boost business investment, because of large excess capacity facing many companies. In answering questions about the sustainability of the current recovery, Professor Klein believed that there would not be a further recession in the short term. In responding to a question about the possibility that the United States would fall into long-term stagnation (as had the economy of Japan after the burst of its equity and real estate bubbles), Professor Klein made it clear that while fundamental structural changes adopted in the United States should prevent the economy falling into such stagnation, the economy's potential growth, in the near term, might not return to above 4 per cent—as registered in the late 1990s—either.

Professor Kanemi Ban (Osaka University) presented his forecast for the economy of *Japan*. He noted that after a recession in 2001, GDP in Japan stabilized in the first half of 2002, but the stabilization mainly came from external demand, with domestic demand remaining weak. In particular, he noted a continued decline in both business investment and government spending. With consumer and business confidence remaining depressed, and continued difficulties in resolving the bad-loans problems, he expected a continued year-over-year decline in GDP for 2002, to be followed by weak growth in 2003.

He stressed the issue of fragility in the Japanese financial system, delineating a vicious cycle of mounting non-performing loans: whenever the real economy slows down, bad loans would cause worries in financial markets, leading to declines in equity prices, and deterioration in consumer and business confidence, in turn leading to further increases in bad loans. He discussed some measures adopted by the Government in disposing of bad loans, including direct capital injection to banks, setting up of the Resolution and Collection Corporation, and purchasing cross-holding stocks owned by banks. But, he mentioned, banks seemed hesitant to accept these measures. He also remarked that these

measures would in the short run lead to more bankruptcies, more unemployment, and higher tax burdens.

Mr. Peter Pauly (University of Toronto) presented a summary of projections for the *developing economies*. Developing countries have faced a very challenging environment in 2002, and likely will continue to do so into 2003. The environment is marked by weak external demand, low prices on most non-fuel commodities, and shrinking private capital infusion. Region-specific difficulties include the worsening financial predicament in Latin America, in which economic recovery depends almost entirely on the resurrection of North American demand. The presenter argued that the Latin American economies have been mired in an economic rut: shrinking capital inflows, domestic contractions, worsening fiscal situations, eroding investor confidence, and increased risk premia. Though contagion is still possible, in some ways it has already been incorporated into market assessments of country risk.

In *East Asia*, a continued rebound is underway, but it too is highly dependent on North American demand. In *Africa*, the continent recorded 4 per cent growth this past year, but little per capita gains were recorded, while in *West Asia*, moderate increases in oil prices are helping, but gains are offset by global sluggishness.

Emerging markets capital flows remain difficult. External financial conditions are arduous and, while FDI remains a major source of flows in the emerging world as a whole, it is highly concentrated in large Asian and Latin American economies.

GDP growth in the developing world was on the whole lacklustre. In 2002, projected year-end growth in *Latin America* will be well below average (at 3.5 per cent), with an expansion forecast for 2003 and 2004. However, even in the medium-term, growth will be below potential. Latin American fortunes have weighed down total developing country results. The large economies of Argentina and Venezuela have contracted, and while Brazil, Mexico and Chile are still growing, they have slowed considerably. Growth in Asia has been more buoyant, with China (7.5 per cent), India (4.5-5 per cent), the Republic of Korea (6 per cent), Malaysia (4 per cent), and the Philippines (4.5 per cent) recording healthy growth. The Republic of Korea's growth is especially impressive, as its level not only appears sustainable, but indicative that the country has finally moved past the 1997 Asian financial crisis. In Africa and the Middle East, growth has been much slower. North Africa has recorded growth of about 3 per cent, while Sub-Saharan Africa recorded 4 per cent growth, with the potential of growing at 5 per cent by 2004. South Africa, the largest economy on the continent, has grown between 2.5 per cent and 4.5 per cent.

Current account problems remain dire in some regions. In Latin America and Africa, current accounts (as percent of GDP) remain in high deficit, while recent growth and higher oil prices have respectively produced small surpluses in South and East Asia and West Asia.

Mr. Pauly believed that several key items would impact the outlook of the developing economies. First, the growth (or contraction) of North American imports will be a key for developing countries. As a whole, developing countries have not had a good year, and sluggish world demand for their primary, intermediate and/or final goods is reflected in the overall results. Second, the financial sector and capital markets in Latin America need close attention. If they return to health, the stalwarts of the region will return to growth more quickly. Third, China will need close attention in regard to both its ballooning budget deficits, and in regard to the impact of its recent WTO accession. (See a review of a paper on this subject later in this report). Fourth, structural reforms in India and Southeast Asia will play a role in continuing growth in the region, and finally, the resumption of tech exports from Asia (after a contraction of 18-24 months), followed by increased expansion of the sector, will be an engine for regional growth. (See a review of a paper on the IT sector in Southeast Asia later in this report).

In the discussion, participants from the regional/national centres posed questions as to various scenarios, and added their opinions to the prospects.

Mr. André Hoffman from the Economic Commission for Latin America (ECLAC, United Nations) began his presentation by pointing out that inflation in his region has been very low by Latin American standards. The historic low of about 8 per cent appears to be on the rise throughout the continent, due primarily to events in Venezuela and Argentina. Unemployment also has been on the on rise (9 per cent) and is bound to increase rapidly due to Argentina, Venezuela and Uruguay. These three countries account for some of the largest declines in growth on the continent. Uruguay is experiencing its fourth consecutive year of decreased GDP, while Venezuela is contracting by 7 per cent. The extent of decline in Argentina is debatable, though a strong second quarter of 2002 suggests a bottoming out of its contraction. Given the second quarter's results, and the positive outlook for the third quarter, the annual decline may be about 10 per cent. Brazil is a difficult case primarily because of the current elections, and the uncertain impact they will have on capital flows, investor confidence, etc. Despite this, there are some bright spots: Mexico is performing better than expected (with its strong NAFTA-enhanced position and an expanding industrial sector, its current forecast of 1.5 per cent growth may be low), as is the Dominican Republic.

Policy options are limited in Latin America. Fiscal policy (and especially stimuli) is constrained in many instances by high deficits (such as in Venezuela). Monetary policy is a complicated tool in the region because the transmission from interest rates to the wider economy is somewhat muted, or perhaps even questionable (such as in Chile). Brazil's high interest rates also make policy options complicated for South America's largest economy.

Ms. Pami Dua (Delhi School of Economics) suggested that 5 percent growth for India (rather than the 4.7 per cent presented in the LINK projections) seems more accurate. The industrial sector is growing well, as is the services sector. Mr. Cletus Durdonoo (Clay Dord Consult, Ghana) added that the first half of 2002 looks promising for growth in Ghana. The three main exports—cocoa, timber and gold—are all performing well.

Unfortunately, the condition that led to a rise in cocoa prices is unsustainable. An additional negative factor is in regard to the increasing crime rate in the country.

Ms. Charlotte du Toit (University of Pretoria) provided some further information on South Africa. Inflation remains a key concern, with CPI now up to 10.8 percent in the country. The Reserve Bank has increased rates, but inflation is increasing due to food prices, the depreciation of the Rand and rising oil costs. There has been a rise in nominal unit labour costs, but this does not counteract the most pressing economic problem for the country: extreme unemployment, with a rate of about 41.5 percent. On the positive side, GDP growth is projected for about 2.1-2.2 percent, with some strength on both the supply and demand sides. The weak rand, as well as a reduced tax burden, should help near term growth. Still, medium-term growth will be far below potential

Some additional questions were asked by participants including some which suggested further lines of inquiry (such as a development of alternative scenarios for a war in Iraq or a cessation of hostilities, and a potential future analysis of the impact of free trade in East Asia), while others asked for responses.

Asked why Africa is doing so well. Mr. Carl Gray (United Nations) responded by pointing to a host of factors that have come to fruition in the past 12 months and will likely continue to help African development in the near term. These elements include the existence of widespread advantageous tariff agreements between the developed world and Africa (such as the United States' African Growth and Opportunity Act), the increasingly positive impact of sound economic management (due in part to the implementation of Poverty Reduction Strategy Papers), high commodity prices for some countries, rising political stability, and an expected improvement in terms of trade from increases in commodity prices.

Commodity Prices

Mr. Robert Kaufman (Boston University) and Mr. F. Gerard Adams (Northeastern University) provided an outlook for broader commodity prices.

In his presentation, Mr. Robert Kaufman, focusing on the role of OPEC in the oil market, tried to explore the following questions: Does OPEC have a significant role in oil price formation? Does OPEC have a backward bending supply curve? Is there an externality in oil stock formation?

With an equation estimated for the determination of the oil price by variables such as *"Days of forward consumption (stocks)", "OPEC quota", "Cheat", and "Capacity utilization"*, he showed that causality effects between prices and *days, quota and capacity utilization*, was significant, but not with respect to *cheat*. There is evidence that OPEC can affect oil prices just by setting a production quota, irrespective of the fact that cheating occurs—that is, irrespective of actual output. Also, OPEC doesn't seem to have an oil

supply curve in the conventional sense that production responds to changes in prices. Rather, it acts on production and in doing so affects prices.

He also explained externalities in oil stock formation. Firms generally hold oil inventories for the purpose of ensuring efficient operations and reducing the likelihood of disruptions in production, but these are expensive to build and maintain, and there has been a general tendency to reduce inventories. On the other hand, the social cost of reducing stocks may have been higher than the private savings, as oil prices have tended to increase as a result of lower stocks. However, this externality may be asymmetric: the cost of building storage capacity is very high, and probably the private costs associated with rebuilding stocks are now higher than the accrued social benefit.

Remarking on the effect of a war in Iraq on oil prices, he recalled that in the 1991 war, oil prices started increasing after the invasion of Kuwait, and continued to do so until the air war started, when they started declining, probably due to the dissipation of some of the uncertainties. Prices reached another peak when the ground war started. Forecasting the effect is difficult this time, but prices are looking much the same as they did 10 years ago. There are clear signs that other producing countries, many of them cash-hungry, will be eager to compensate for the temporary disruption of production in the event of a war.

Mr. Adams projected a continued price decline in many non-fuel primary commodities, continuing the trend that began in the mid-1990s. A declining United States dollar may cause even lower prices, given the low price-elasticity of production for many of these products.

There have been significant long-term declines in copper and, so long as inventories remain high and a substantial global recovery is under way, it is difficult to visualize a significant recovery in prices. Furthermore, significant reductions in stock levels that can affect prices take a long time to materialize.

In tropical beverages, the evolution of cocoa prices has offered a striking exception to those of coffee and, to a lesser extent, tea. Whereas cocoa production is very concentrated, coffee is produced in a very broad area of the world. Although there is some degree of substitution by growers occurring (from coffee to cocoa), it is a very slow process.

As to agricultural crops, their evolution depends much on what happens with agricultural policies in both the United States and the EU, and particularly in regard to recent price-support initiatives.

2. ECONOMIC POLICY ISSUES

Ray Barrell (NIESR) presented a paper titled *Choosing the Rules – Fiscal and Monetary frameworks in Europe*, in which he analysed the short and long term issues involved in designing an optimal fiscal and monetary framework. These policy

frameworks are intended to control both the level and volatility of growth and inflation. Volatilities are important because they affect the level of output and welfare in the long run. Volatility affects the cost of capital and the real exchange rate, which in turn affects the level of the capital stock. The choice of framework can also change behaviour through its effect on expectations.

Discretionary fiscal and monetary policies have not been very successful in stabilizing output and inflation. A fiscal framework with commitment to low debt can help stabilize output volatility. At the same time, both auto-stabilizers and responses to serious events are still possible. As an example of fiscal rules, he cited the Maastricht convergence criteria (now the Stability and Growth Pact) that sets maximum bounds to the deficit to GDP ratios, and the UK's fiscal framework, where a deficit finances public investment only and must balance over the cycle.

The fiscal framework for the euro zone contains two elements. The Stability and Growth Pact is a treaty with specific numerical targets, so it is hard to change. The Broad Economic Policy guidelines set medium term targets that are agreed to by finance ministers and the EC. Currently the agreement is that budget plans should aim for balance or surplus in the medium term; increasing deficits are frowned upon. But this broadly framed guideline could feasibly be reinterpreted in the future. For example, the medium term goal could be modified for transition economies or for countries with low debt, or if expenditures are made for public infrastructure projects. This framework can be modelled as a tax feedback rule with deficit and debt targets.

The monetary policy framework chosen by the ECB consists of two pillars: an inflation target and a target on a monetary aggregate, which can be interpreted as a target on the level of nominal income, and thus the price level itself. This can be modelled as a feedback rule whereby interest rates are determined by deviations from these two targets.

The effects of these rules on the volatility of variables of interest were assessed in an experimental framework, using the NIGEM model and stochastic simulation (using historical shocks from the period 1991Q1-1999Q4). The rules were modified and the effects on the system observed. The choice of rule would depend directly on the weights on volatility in the policy welfare function and indirectly through the effects of volatility on the level of output.

The first experiment was to turn the fiscal rule on and off. When the rule was off, the volatility of the deficits increased significantly in all countries. In fact, given the current initial conditions and the distribution of possible histories, the 3 per cent bound was often breached; there were even outcomes that breached 5 per cent deficits. But if the initial position was one of budget balance, then it was very rare to breach 3 per cent. Secondly, the feedback and auto-stabilizers did not work against each other—the volatility of output was not very different with the rule on or off, while the relative inflation volatilities were even more similar. This was because changes in budget deficits are largely orthogonal to the cycle, having more to do with tax revenue shocks. Solvency constraints kept deficits within bounds, but had little impact on volatility.

How important is volatility? When viewed as a source of uncertainty, it has an important impact on economic welfare. Theoretically, welfare should increase in the long run under the EMU, because the reduction in uncertainty leads to increased investment and so to a larger capital stock and thus higher potential GDP. The second experiment was to assess the effect on volatilities of including or excluding the UK from the euro zone. It was found that output volatility increased, both inflation and real exchange rate volatility decreased, and long-run real interest rate volatility was about the same.

Which volatilities mattered the most? This depended directly on the relative weights in the policy maker's welfare function on output and inflation volatility, but also indirectly on these volatilities through their effect on the level and long-run growth rate of output. Turnovskey (2001) argues that the volatility of the real exchange rate and the user cost of capital are most crucial, because these are important determinants of FDI and the location of economic activity. Byrne and Davis (2002) show that real exchange rate uncertainty has an important impact on investment.

The final two experiments assessed the impact of different monetary policy arrangements. First, the ECB monetary policy rule was compared to an industry standard Taylor Rule. Results were that the volatilities of both the real exchange rate and the real long run interest rate were lower under the Taylor Rule, but this gain should be discounted by the fact that price level uncertainty would be higher. Secondly, the change in regime from policy under the ERM, where interest rates were determined by the German Bundesbank according to the EMU policy rule, was investigated. At the country level the volatilities of the respective real exchange rates fell significantly, as did the volatilities of the real interest rate under EMU. For Germany, the change was small, but not in relative terms compared to other countries. This was important because, if the relative volatilities of these variables change across countries, this will affect investment location decisions. Consequently, after EMU, France and Italy may have become more attractive locations for FDI.

Gianpaolo Rossini (University of Bologna) and Paolo Zangheri (CEPII, Paris) in a paper entitled *Saving and Investment in Euroland, The EU, and the Enlarged EU*, discussed empirical work related to the Feldstein-Horioka (F-H) puzzle, which is one of the class of home bias problems that have become stylised facts in international economics. The puzzle relates to the empirically close relationship between domestic savings and investment in cross sectional analysis. This implies that most of national savings is invested at home, making domestic savings a very strong determinant of domestic investment. However, this fact points to a lower than expected degree of international capital mobility.

The authors test the F-H puzzle for various European aggregates (EMU, EU, "pseudo-EU," and enlarged EU) using a cleaner measure of domestic investment, obtained by subtracting the net inflow of FDI from total investment. They found that in all cases examined, the more precise definition of investment resulted in the F-H coefficient becoming smaller, meaning that co-movements of saving and investment tended to become less important, and that capital mobility was higher. Comparing different aggregates of Europe, they found that the degree of capital mobility, as signalled by the F-H coefficients,

was fairly high, even for the enlarged EU. In the EU the F-H coefficient was low in the 1970s and 80s, but increased substantially over the 1990s. It was argued that this was a result of countries targeting their current accounts (and thus closely matching savings and investment) in their quest to qualify for the EMU. On the other hand, the enlarged EU showed a lower F-H coefficient over the 1990s, compared to the 1980s, pointing to an increase in capital mobility.

Zsolt Darvas (Bank of Hungary), in a paper entitled *Exchange Rate Pass-through and the Real Exchange Rate in EU Candidate Countries*, studied the impact of exchange rate movements on consumer prices in four EU candidate countries. The usual pass-though model relates exchange rates and import or export prices, but in this study the pass-through to consumer prices (excluding administered prices and prices with seasonal and highly volatile patterns such as food and energy) was studied. A key characteristic of the EU candidate countries is that their price levels are far lower than the EU average and their economies are growing faster, indicating that the equilibrium real exchange rates are on appreciating paths.

Darvas' approach had three distinctive features: it modelled price and exchange rate changes jointly, it utilized an error correction mechanism incorporating an equilibrium real exchange rate, and it allowed time varying parameters in the short run equations. The joint modelling of inflation and exchange rate changes allowed the nominal exchange rate to respond to both real exchange rate misalignments and to its own previous shocks. The error correction formulation allowed the sources of price changes, either nominal exchange rate shocks or equilibrating real exchange rate appreciation, to be distinguished. Finally, the time varying coefficients allowed for behavioural changes, aggregation, changes to the inflationary environment and exchange rate expectations, and non-linear corrections to the long-run real exchange rate.

The model was supported by empirical analysis. Fixed coefficient estimates were unstable and there was ample evidence of structural breaks, while allowing for time-varying coefficients led to significant coefficient estimates with correct signs. It was found that pass-though was generally higher, particularly in the long run, in Hungary and Slovenia, countries with managed exchange rate regimes, as compared to the two with freely floating regimes, the Czech Republic and Poland.

Franjo Štiblar (University of Ljubljana) presented only one part of his paper—*The Impact of Ownership on the Performance of Micro Units: Comparison Between EU Members and Candidates*. He discussed his results for banks, leaving aside the other two parts, which concern insurance companies and blue chip manufacturing firms. The paper is available on the website covers all three.

The purpose of the investigation was to ascertain the relationship between ownership and performance of various banks (and other companies in the paper), and thus to establish the most appropriate ownership structure for optimal corporate governance, especially as it pertains to the protection of minority owners in countries that hope to join the European Union (EU) in the near term. The author has collected information on

ownership structures, size, concentration, profitability, efficiency, and other variables of 88 banks in 14 countries: seven EU members (Austria, Belgium, Germany, Greece, Italy, Portugal, and the United Kingdom), Norway, and six economies in transition (EiTs) that aspire to EU membership in the current accession round (the Czech Republic, Hungary, Poland, Slovakia, and Slovenia) or the next round of EU widening (Croatia).

The author sought an answer to the basic question by looking at efficiency and profitability indicators, from which he then drew conclusions for macroeconomic policy. Given the nature of the data, the author relied essentially on simple correlation and ordinary regression analyses.

The author found that majority foreign-owned banks in EiTs are highly concentrated and under-serve local customers due to their focus on transnational corporations. The author interpreted this as sufficient reason to advocate that EiTs need to insist on having their own domestic banks in order for policy makers to pursue longer-term development strategies. One of the surprising findings of the investigation was that majority foreign-owned banks in EiTs tended to be less efficient than their EU—including Norway—counterparts, although they accounted for a much larger market share in EiTs. One possible explanation offered by the author was that these banks might be resorting to transfer pricing in order to avoid profit taxation.

The purpose of Paolo Onofri's (University of Bologna) paper—*The Pension Reform in Italy and its Effects on the Propensity to Save*—was to assess the impact on private savings of the pension reforms undertaken in Italy between 1992 and 1998. This involved many changes, but essentially moved the system away from a pay-as-you-go (PAYG) model to a funded system, after a protracted transition period to protect those who had served some years in the old scheme. The author underlined that if development and growth depend on domestic savings, as now seems well established, moving to a funded pension system that has fewer benefits than the old system would constrain growth prospects. This would be especially so due to the impact such a system would have on younger cohorts who will eventually be entitled only to funded benefits.

The experiences with savings since the system was first introduced can be reduced to the fact that only about half of the "savings lost" by moving from a PAYG to a fully-funded system are being replaced. The presenter thought there might be reverse intergenerational transfers from present pensioners to the younger cohorts. Also, the latter's outlook for finding gainful employment and the prospect of a longer duration of their working life than those benefiting from the PAYG system might discourage savings.

These findings confirmed the long-term decline in private savings since the mid-1960s, whose trend has not so far been reversed as a result of the pension reform. These findings were particularly pronounced when corrections were made for the cohort effects (the so-called Gale effect). There are, as a result, several challenges for policy makers on how to regain substantial growth for the longer term and how best to encourage private savings to provide pensioners with a decent level of living in the decades to come.

Mr. Byron Gangnes (University of Hawaii at Manoa) started the presentation of his paper[2]— *Information Technology Trade and Asia-Pacific Interdependence*—by pointing to the literature's fundamental lack of understanding of the nature and determinants of growth in information technology (IT) trade in the Asia-Pacific region. It is indisputable that East Asian economies have, over the past two decades, become centres of world production and export for IT. However, the authors argue that the rise of IT trade needs to be understood in a new context: the growth of IT trade takes place within an increasingly vertically fragmented production process. This factor has implications for the appropriate specification of empirical trade equations for IT products.

The presenter provided historical evidence of the growing power of East Asian countries in the IT sector, concluding that the region has become a true global supply platform, with substantial regional and international linkages for both intermediate and final goods. Moreover, there is increasing evidence that East Asia provides a good exemplar of the theory of "fragmentation," which seeks to explain why developed country firms decide to move parts of their production processes to other countries. There are various reasons why firms do this, but there are necessary preconditions; first, such a move implies the separability of the production process (which, noted the authors, was significantly enhanced with the arrival of the personal computer). Additionally, reduced transport and communications costs have made such fragmentation possible.

The author proceeds by examining the FDI-trade nexus, reviving the debate over whether FDI and trade are substitutes or complements. Within the framework of IT production, it seems as though the two are complements, with FDI inflows and IT exports positively related. However, the impact of such FDI on exports varies across countries and industries. With this literature base, the paper advances by establishing empirical trade equations for IT exports, appending an FDI inflow variable onto the baseline equation.

In order to model IT trade, one needs intermediate and final demand, relative cost of components, role of inward FDI (flows and stocks) and other variables. Unfortunately, this poses severe data challenges, related, in part, to short time series, the absence of relative price data, no comprehensive bilateral FDI or price data, and limited data on IT-specific activity. The methodology in the paper relies on using pooled bilateral export equations for East Asian IT exports. Results, albeit preliminary, point to heavy trade dependence; for example, 17 percent of Malaysia's GDP is derived from exports to the US, a fact that makes the country—and the overall region—very vulnerable.

Ms. Pami Dua's (Delhi School of Economics) work—*East Asian Crisis and Contagion: The Case of India*—contains the results of two econometric models that examine the impact of the 1997-98 Asian Crisis on the Indian economy. As background, the author recounted the main features of the crisis that originated in Thailand and affected Indonesia, the Philippines, the Republic of Korea and Malaysia most seriously. During the crisis, the most significant impact on the Indian economy was a 15.6 per cent depreciation of the rupee-dollar exchange rate from June 1997 to December 1998, a drop in foreign

[2] Co-authored with Ari van Assche and Carl Bonham.

currency reserves from $26.8 billion in August 1997 to $24.3 billion in June 1998, and their subsequent recovery to $27.3 billion by December 1998.

A four-country contagion model was used to examine the impact of the crisis on India, the Republic of Korea, Malaysia and Thailand from June 1997 to December 1998 over three distinct time periods—June 1997 to December 1998, June 1997 to February 1998 and March to December 1998. Three economic variables—money supply growth, foreign exchange reserves (relative to an index of industrial production), and real effective exchange rates—were used to examine the contagion effect in the four countries using the panel data framework. In the modelling framework, a high rate of monetary expansion and rapid currency deprecation were taken as leading indicators of contagion, while a rise in foreign exchange reserves indicated a reduction in contagion effects.

The results indicated contagion through the three economic channels for Thailand and through reserve changes for the Republic of Korea during the entire period of the crisis (June 1997 to December 1998). Contagion occurred through exchange rate volatility in the Republic of Korea and Malaysia from June 1997 to February 1998 and through exchange rate volatility in the Republic of Korea and Malaysia from March to December 1998. During the latter period, Malaysia also experienced contagion through excessive money supply growth. Contagion in India was detected only through excessive money supply growth from March to December 1998. A separate time series model of Indian exchange rates also failed to detect any significant contagion during the period of the crisis through exchange rate volatility.

The weak contagion effects of the Asian Crisis on India were attributed to (a) weak trade linkages between India and the most seriously affected countries—trade between India and Thailand, for example, accounted for less than 2 per cent of India's exports and less than 1 per cent of imports, and (b) stabilization policies enacted by the Reserve Bank of India (including tight monetary and restrictive credit policies during the crisis) that helped to reduce speculative pressure and excessive volatility of the exchange rate.

Mr. Roberto Mariano's (Singapore Management University) presentation—on his[3] paper *Markov Regime Switching Models of Currency Crises in Southeast Asia*—provided an alternative approach to linear dynamic modelling of currency crises with applications to some South East Asian countries. The alternative approach used a basic Markov-Switching model to predict currency crises in Indonesia, Malaysia, the Philippines, Singapore and Thailand. This model was extended to a generalized autoregressive conditional heteroskedastic (GARCH) model framework that also incorporated a Markov-switching feature in the GARCH specification of the behaviour of the error terms in the model (the extensions refer to just an ARCH process in some of the country models).

The basic model was constructed to provide a set of reliable and observable indicators of impending currency difficulties and was presented as a new analytical framework that avoided numerous limitations and pitfalls of earlier approaches. Although these earlier approaches were touched on briefly, they were not discussed at length in the

[3] Augustine H.H. Tan, Celso Brunetti, and Chiara Scotti are additional authors.

presentation. Mr. Mariano invited meeting participants to contact him at rsmariano@smu.edu.sg (or to visit his website) for more detailed and extensive descriptions of these earlier approaches which are described in some of his previously published work.

The basic model is a linear regression model that assumes a latent (unobservable) Markov chain that describes vulnerability to speculative attacks on the country's currency and conditions that determine the switch from a normal state to a crisis regime. In each country model, the dependent variable is the percentage change in nominal exchange rates. The indicator variables are (a) trend deviations of real exchange rate overvaluation of the national currency, (b) money supply relative to international reserves and (c) real domestic credit. The normal state is characterized by a mean of close to zero and low variance (low volatility) in the percentage change in exchange rates. The vulnerable, or turbulent, state is characterized by a high (positive) mean in the percentage change in exchange rates (representing depreciation if exchange rates are measured as the domestic price of foreign currency) and a high variance, indicating high volatility in exchange rate changes. Markov switches govern changes in the mean and variance of the dependent variable. Transition probabilities for the Markov chain vary over time (between normal and vulnerable regimes) depending on values of the indicator variables. Indicator variables could also serve as leading indicators (or early-warning signals) of impending currency crises if they have the right sign and statistical significance in the estimated coefficients of the transition probabilities.

In the empirical studies, real exchange rate overvaluation was identified as the most significant indicator variable and early-warning predictor of a switch from normal to vulnerable regimes. The results were mixed for the other indicator variables. Money-supply growth was important in all countries except the Philippines, and domestic credit expansion was important in all countries except Singapore. The basic model performed well as a predictor of past currency crisis episodes (in some cases providing strong signals several months in advance of the crisis) in Thailand (1981, 1984 and 1997 episodes) and Malaysia (the 1997 episode). The model performed poorly, however, in predicting crises in Indonesia, Singapore and the Philippines where the empirical results provided only weak warning signals and coincident indicators. Extensions of the model to the ARCH/GARCH specification of the variance structure improved forecast performance for some countries.

Mr. Elcyon Caiado Rocha Lima (IPEA and UERJ, Brazil) began the presentation on his paper—*The NAIRU, Unemployment and the Rate of Inflation in Brazil*—with a lengthy listing of shocks and other instabilities in Brazil's economy over the past twenty years. This instability provides the underlying motivation for his paper, as economies that suffer repeated shocks have proven very difficult to model. The author's subject, estimating Brazil's Non-accelerating Inflation Rate of Unemployment (NAIRU), is dealt with in light of instability, with the introduction of estimated error bands and other features that are designed to deal more adequately with recent instability in the Brazilian economy.

The paper proceeds by investigating the stability of coefficients of the Brazilian Phillips Curve, and the relationship between the rate of inflation and the deviation of the

observed rate of unemployment from the NAIRU. The Phillips Curve is estimated for 1981-2001, a time during which many shocks and consequent stabilization programs were present in Brazil. Two different models are used to calculate the natural rate of unemployment: one model with a time-varying NAIRU and another model in which the NAIRU changes over time according to a hidden Markov chain specification. (This was done because the first model allows for ARCH residuals, while the second allows for both persistent heteroscedasticity and a richer pattern of time variation for the NAIRU.) Using the Phillips Curve as a tool of analysis, the author also wished to join in the recent debate on the curve itself, mentioning some recent studies that concluded that the curve is of little use, and others suggesting that its use needs to be modified from Phillips' original contentions.

Two questions are answered by the paper's conclusions. First, the author asks if there is a statistically significant relationship between a deviation of the rate of unemployment from the estimated value of the NAIRU and the rate of inflation. As expected, there is a significant and negative response of inflation to an increase in cyclical unemployment. However, there are issues with precision in this regard, and placing any values on the impact of the NAIRU and inflation remains uncertain. The second question concerned whether the degree of measure of the NAIRU is significantly different from the observed rates of unemployment across time. Again, the answer depends in large measure on the degree of precision with which the NAIRU is estimated.

Despite the questionable findings (due to concerns of precision), the author pointed out two important conclusions from this work. First, the degree of precision of his work will improve over time, as more research is done on the NAIRU. Second, the research revealed some interesting facets of the Brazilian Phillips Curve; according to the author, the curve is very steep in Brazil, which makes any economic policy that attempts to trade off unemployment with inflation potentially disastrous.

Cletus K. Dordunoo's (ClayDord Consult, Ghana) work—*Ghana: Aggregate Supply Growth Models and Policy Implications*—which aims to resurrect the Harrod-Domar (the Incremental Capital-Output Ratio [ICOR]) growth model for forecasting economic growth, had three linked motivations. The internal motivation comes from the political/economic debate within Ghana concerning growth projections, and the unclear methodology/models used to attain the projections. External motivation was from various sources, including the West African Institute of Financial and Economic Management's request for a paper on "Macroeconomic Policy Modelling of Growth in Ghana." Finally, the author notes a "literature motivation" for his work, and especially an absence of literature that attempts to link "theory" with "data" as it pertains to the Ghanaian economy. This paper was written to fill the void of quantitative analysis of Ghanaian growth, and respond to the various motivations mentioned. The paper intends to estimate ICOR-based production function, and to determine if it has a better performance capability over the production functions of Cobb-Douglas, Leontief-Harrod-Domar, or Constant and Variable Elasticity of Substitution types.

The author first conducted a brief literature review illustrating some of the reasons why ICOR-based modelling has not been used. In particular, in low income countries

(such as Ghana) the various assumptions implicit in ICOR can make for negative ICORs (which are meaningless) if the assumptions don't hold. For example, ICOR's reliance on agricultural output relies on good rainfall, a condition often not met in many developing countries. Additionally, management must be competent enough to effectively use and combine all inputs, particularly labour. The paper advances by comparing the performance of ICORs with the production functions of competing systems listed above.

The author presents nine equations that make up the ICOR-Model (details available in the full paper online), and presents empirical and simulation results from the equations. On the basis of the results, the author posited a relationship between growth rates and resource requirements. The results indicated that a real GDP growth rate of 5 percent and an ICOR of 2.5 are associated with gross investment rate of 13.9 percent of GDP and a savings resource gap of 3.9 percent of GDP. Though powerful linkages, the author notes that the use of ICORs in GDP projection necessitates easing constraints on labour, managerial expertise, capacity utilization and other non-investment factors that impact labour production. (Without this, using ICOR models carries significant forecasting risks).

The second part of the paper brings in the production function methodology. Based upon the evidence, two of the models mentioned (Bodkin-Kline CES, and the Linear Leontief) accurately describe Ghana, with the conclusion that the ICOR model is much more robust for predicting investment requirements than are the production functions, while the Bodkin-Kline and Linear LHD models powerfully capture overall GDP performance.

3. MODELLING TECHNIQUES

Several papers covered techniques in econometric modelling and forecasting. In addition, David Hendry presented the inaugural Lawrence R. Klein Lecture in Forecasting.

Carl Weinberg (High Frequency Economics, USA) presented *An Indicator-Derived Primer on the Upcoming Quarters: Risks of Global Stagnation versus Chances of Recovery*, where he compared indicator-based short-term analysis with structural model approach. He argued that the indicator approach could be viewed as a "single equation reduced form approach."

Mr. Weinberg began his presentation with some general observations on the structural model approach to forecasting, noting that most of the forecasts presented at the LINK conference told the story of a bad current state of the world economy, but that GDP was forecast to return to trend. He argued that models are explicitly designed to return to trend, and that this trend was based on the experience of the last 40 years. But if there has been structural change, then what would a structural modeller do? For example, a model of Japan from 1990 would not have been good predictor of the Japanese economy during the 1990s, precisely because of structural changes. Further, there have been structural changes in the EU as well. Consequently, why should we forecast a return to the old trend? He noted that the survey of business managers was more pessimistic than the recent structural forecasts, but that such surveys were inherently not affected by past trends.

In the LINK report, the world economy depended heavily on the performance of the United States, its influence manifest primarily through imports. But the swing in United States imports over the last 10 years represented only 1 per cent of world imports, which was too small to be the only driving factor. For example, in the euro zone, part of the weakness stemmed from policy difficulties. In September, the year-over-year increase in oil prices was substantial. This was important to the ECB and it was affecting wages. Core inflation in the EU had accelerated and would be adversely affected by the recent increase in oil prices, so that the ECB would be unlikely to cut rates.

In the United States there has been a second dip in short-term indicators, but inventories and orders had increased. Many people felt that consumer spending would slow due to the stock market and depressed consumer confidence. But 95 per cent of consumption spending can be explained by disposable income; consumer confidence is far less important. United States disposable income had increased since 2000 and was recently increasing, while in the EU it had been stagnant.

Using the wealth effect to explain reduced spending is difficult, as there remain questions as to how large this effect is, and difficulties with empirically identifying it. Looking at a long time series of stock market data, and drawing a trend line, it was easy to see a bubble in 1990s and that current price levels are significantly reduced from their peaks. Current levels are still better than what would have been anticipated in the 1980s. Finally, although the stock market is depressed, house prices and bonds are up, so that total wealth is still not a major depressing factor. In the last 150 years there have been 14 corrections of 35 per cent or more, so that on average you will see a major correction every 10 years, making the recent correction nothing unusual.

In Germany, the IFO index (1969-present) had a very good correlation with industrial production. It has declined for the last 4 months in a row and in history this has usually been associated with a decline in industrial production. The absolute level of the IFO index was also important, and currently it was below the level consistent with declining industrial production. Why had it fallen? At the end of last year it had begun to rise, driven exclusively by an increase in business expectations, which were perhaps not entirely rational. The current situation component of the index was stable, so a gap between the two developed. Eventually either the current situation had to improve or expectations deteriorate, and the latter is what has been observed recently. This was now consistent with GDP growth under 2 per cent. Why had expectations deteriorated? The increase in inflation in the second half of 2002 led to a decline in real disposable income. With nominal wages fixed, real wages had fallen. In addition, there was important structural change in the EU as the policy environment was now quite different. Because the ECB was targeting the average HICP across the zone, for some countries interest rates were too high, while in others too low. On the fiscal front, the Stability Pact was forcing countries to make spending cuts in a recession.

In Japan, the principal character of its economy was contraction for a decade. Industrial production was currently lower than in 1988, while employment in 1993 was higher than now. In addition, Japan has experienced a destruction of its asset base. It was

crucial to eliminate the process of credit reduction, but the latest plan to write off some of the bad loans would lead to a short-term decrease in credit.

Finally the speaker discussed three new areas of concern. He felt that not enough attention had been paid to the effects of the euro zone enlargement. Would there be significant costs through high transfer payments, citing the case of Germany, or would average inflation be higher? Secondly, he wondered what the outcome of the violations of the Stability Pact would be. Would Germany be fined? Finally, he felt that the US dollar might remain strong even though forecasted growth in the US may be lower than once thought; growth prospects in the EU and Japan were no better. Additionally, the stock markets in the EU and Japan were depressed more than in the US. In terms of worries over the US current account, while it was true that in terms of GDP the figure was large, if viewed in terms of the world money supply or world trade, it was well within bounds. Regardless, the large figure does not take into account the stabilizing impact gained from the fact that the US dollar should be viewed as a key reserve currency.

Professor Steven Hall (Imperial College) presented a paper entitled *Rational Expectations and Near Rational Alternatives: How Best to Form Expectation* co-authored by M. Beeby and S.B. Henry. In the introduction, he stated that although Rational Expectation (RE) had been dominant since the Lucas critique of the 1970s, many economists/econometricians still believed that RE was a highly restrictive assumption, requiring that agents not only use all their information optimally, but, more importantly, that they would have all the information required to forecast. Therefore, he mentioned, as an alternative to the assumption of RE, economists had begun experimenting with learning processes—agents would learn gradually about the economic environment over time. As learning rules have been increasingly used in macroeconomic modelling, one criticism has been that the variables included in the learning rule are arbitrary. This study was to test how important the particular learning specifications would be.

By incorporating various learning rules in a large-scale macro model, he reported that their study indicated that, although the solutions based on various learning rules were quite different from the solution based on RE, differences among the learning rule solutions are minor. Particularly interesting was the point he derived from their study that only a very small departure from full RE (or so-called "near Rational Expectation") would move the model properties most of the way from the RE solution to the learning solution. Therefore, in his view, RE would not give rise to representative model properties and, if real agents would have only very small departures from rationality, the RE assumption would not be a good approximation of their behaviour.

Professor Stefan P. Schleicher (University of Graz), presented a paper entitled *Correcting Taylor Rules for Forecast Biases*, co-authored by Heinz Gluck and Rosaria Catena. The paper represents a continuation of work that they first reported at the 1998 LINK meeting in Rio de Janeiro, Brazil. Based on their previous findings that the empirical econometric test showed a rather weak Taylor Rule policy formulation in many

developed economies,[4] this paper studies the possibility of policy errors caused by erroneous and biased forecasts of inflation and GDP growth.

First, focusing on monetary policy, Mr. Schleicher reported their study of ex-post relationships among short-term interest rates, inflation rates, and GDP output gaps for all G7 countries. Since the Taylor Rule would imply a forward-looking policy behaviour, he then reported their investigation on the similar relationship among these variables, but using OECD forecasts of inflation and GDP growth rates. He reported that they found a much better forecasting record for inflation than for GDP growth rates, and believed that the forecast GDP would almost be uninformative at the time a Taylor Rule was applied. He also reported their result from ex-ante simulations by correcting some biases in the forecasts of inflation and GDP growth rates, showing that policy errors (unnecessary changes in interest rates) in such cases would be smaller. In conclusion, he stated that their study would support critics that a useful monetary design should be founded on realistic assumptions about what policy makers could know when policy decisions are made.

Mr. Roberto Golinelli (University of Bologna) presented the paper[5] *Real-Time GDP Forecasting in the Euro Area* that describes alternative modelling techniques for real-time prediction of economic activity in Italy, France, Germany and the Euro area as a whole through single country models and a benchmark structural model for the Euro area. The country models substitute statistical indicators of economic activity for official national accounts data as explanatory variables because of the long delays in publication of official data. Statistical agencies within the EU publish estimates of quarterly national accounts data with a 75-day delay. "Flash estimates" provide the earliest indication of economic performance as soon as possible after the completion of each quarter, but they are considered unsuitable for analytical and modelling purposes because they are often developed with incomplete information and ad hoc statistical procedures. The modelling exercise described in the presentation focused on the estimation and use of "bridge models" that incorporate a wide variety of contemporaneous statistical indicators to provide up-to-date estimates and forecasts of key economic variables.

Indicator-based bridge models with a forecasting horizon of one or two periods ahead have been developed for Italy, France and Germany. Demand side models are univariate ARIMA or VAR models with expenditure components (total private consumption, public consumption, gross fixed capital formation, exports, imports and stock variations) as the dependent variables. Statistical indicators such as indices of consumer confidence and sentiment, wages, unemployment claims, new car registrations and survey results of different types of business activities are taken as explanatory variables. Aggregations of the estimated components yield forecasts of GDP on the demand side. Aggregate supply-side GDP models are also estimated with indices of industrial production as the main explanatory variable in each country (except Italy where a suitable index was not

[4] The Taylor Rule, originated by J.B. Taylor, advocated the formulation of monetary and fiscal policy based on a feedback relationship between policy targets and policy instruments. A typical Taylor Rule for monetary policy, for example, would define the policy interest rate as a function of the gap between the prevailing inflation rate and the desired inflation rate and the gap between the GDP growth rate and potential GDP growth.
[5] Alberto Baffigi and Guiseppe Parigi are also credited as authors.

available) and proxy variables that serve as indicators of service-sector activity. Country forecasts are further aggregated to produce estimates for the Euro area as a whole. A more conventional five-equation structural model for the Euro area is also used to generate alternative GDP forecasts.

Empirical results discussed in the presentation confirmed the usefulness of the bridge models in providing information on the current state of the economies well in advance of the publication of official data. Follow-up discussions clarified some aspects of the modelling techniques and reiterated that the modelling approach differed substantially from techniques that statistical agencies use to provide estimates of official data from available partial information.

Jean-Louis Brillet's (INSEE, Paris) and Liu Xiaoyue's (National Bureau of Statistics, Beijing) paper—*China Entering WTO: Interpreting the Issues Using the Chinese Annual Models*—attempts to model the macroeconomic impact of China's 2001 accession to the World Trade Organization (WTO). Their methodology involves manipulating the current Chinese Annual Model (jointly developed by the Chinese National Bureau of Statistics and the French Ministry of Finance). However, given the far-reaching implications that WTO membership will likely have, and the potential that WTO accession may actually change the structure of the Chinese economy enough to warrant a new model, the authors were clear to concentrate their results not on actual values, but on "the size and dynamics" of their conclusions.

They first presented a brief overview of the structure of the current model, including such features as the use of annual data, the non-separability of products (except for non-market products), and the four-fold separation of economic agents (firms, households, the State, and the Rest of the World). The model has no regional dimension, an important limitation in the Chinese case given vast differences in regional economic performance. This is a shortcoming admitted by the authors, and they hope that it will be addressed in the near future with improvements to the base model.

The authors model China's entry into the WTO as various shocks to the Chinese economy, with some being internal to the Chinese market, and others impacting the world's demands for Chinese products. Three broad classes of shocks are covered: The Trade Agreement and its Direct Consequences (including a decrease in tariffs applied to Chinese imports by the Rest of the World); Policy Elements (including a decrease in corporate taxes); and Structural Elements (potential impacts, including increasing capital productivity, ex ante increases in productivity investment). Each class of shock is operationalised by specific manipulations of the model. Consequently, in total, the authors examine 13 separate shocks emanating from WTO admission. Unfortunately, due to time constraints at the meeting, the authors were unable to cover any of these shocks in significant detail, though the full paper is available online. However, the authors did present their overall findings, which, in line with their original goal of not putting too much value on "actual numbers," were presented as stylised results indicating the overall positive or negative impact (over the short-, medium-, and long-term) of the 13 shocks studied. The positive and negative shocks are mapped to their impact on GDP, Consumer

Prices, the Trade Balance, and the State Budget Balance. In general, GDP, over the short-, medium-, and long-term is positively impacted by almost all of the shocks, while results for Consumer Prices, the Trade Balance and the State Budget Balance, are either decidedly mixed or skewed more negatively. Please see the full paper for further details.

Discussions on the paper centred about the potential of modelling the likely "side benefits" of WTO accession. With the opening up on the economy, new technologies and processes will likely be introduced, helping speed development. The authors, though, remarked that while such a productivity enhancement variable could be introduced into future models (as they plan to do), because productivity remains exogenous to their current model, such "side benefits" have not been addressed.

Johan Lindén's (NIER Stockholm) paper[6]—*The MICMAC Model for Sweden*—discusses the methodology and logic behind a new macroeconomic model being built for the Swedish economy by himself, M.K. Andersson and P. Lundvik. As the model (whose name derives from being a "Micro" based, "Macro" model) is in progress, the author presented both the scope of the overall project, and the degree to which certain aspects of the model had been completed.

The purpose of the MICMAC project is to develop a medium-term (2-6 years projection) macroeconomic model of the Swedish economy. Any further forecasts are limited via MICMAC because the model lacks any demographic components. The decision was made to make the model a concentrated domestic model, with only a heavily stylised foreign sector. Moreover, many aspects of the model rely on a high degree of aggregation; for instance, there is only one government sector, and only one productive sector included.

MICMAC, at its base, incorporates a simple, dynamic equilibrium model with a long-run steady-state path. It covers five separate sectors, each with different goals/limitations: Households, Firms, Government (constrained by policy rules and budget restrictions), Central Bank (adhering to a Taylor-type Rule), and a Foreign Sector (modelled via four estimated equations). For each sector, a simple equation set is used; see the full paper online for details. Cobb-Douglass production functions are used throughout the model, both to combine intermediate goods (domestic and imported) into final goods, and to model technology. One of the model's outputs is trade, the prime input for the LINK exercise.

One of the reasons for building a new model is because the current model is very strong on the demand side, but weak on the supply side. The author admitted that MICMAC appears to be very weak on demand and strong on supply. However, there may be ways to amend this "over-correction" in MICMAC by adding more short-term components into the system.

Discussion on this paper included an observation that it did seem as though MICMAC was an over-correction of the old model, going from one extreme to the other.

[6] M.K. Andersson and P. Lundvik are also authors of this paper.

A suggested solution was to overlay short-run specifics on a long-run equilibrium model. Further, a query was made about the coefficients in the new model; the new model appears to have coefficients that cannot be estimated. The author agreed and replied that the MICMAC team is trying to estimate as much as possible; the production system is estimated, the wage equations are estimated, the Taylor Rule is estimated, and the entire VAR system for the foreign sector is estimated. Some coefficients, however, are being calibrated, and then estimated.

Mr. W³adys³aw Welfe's (University of £ódŸ) presentation—which discussed his paper *Growth Determinants of Economic Potential: The Polish Case*—began by pointing to the recent emergence of empirical research aimed at explaining the differences in growth rates in the world economy. Starting from the framework of Solow's neoclassical theory, several country studies have been done that attempt to explain the impact of particular factors of actual and potential growth. With this mind, the author decided to extend the usual production function (Cobb-Douglass variant) allowing for simultaneously the impact of R&D capital and human capital (two prime variables found in previous studies to impact growth). His work sought to uncover the potential growth rate of the Polish economy.

Lawrence R. Klein Lecture in Forecasting

In a special session for the *Lawrence R. Klein Lecture in Forecasting*, Professor David Hendry (Oxford University) was invited to deliver a lecture on *Economic Forecasting: Some Lessons from Recent Research*, a paper co-authored by Michael P. Clements of the University of Warwick.

The lecture covered some recent advances and contributions to the understanding of economic forecasting. He used a new framework to explain the findings of forecasting competitions and the prevalence of forecasting failure, and he compared the new framework with a previous formulation, which he believed was silent on the very issues of most concern to forecasters. He also discussed the areas where research remains needed to clarify empirical findings that lack theoretical explanations.

He started with the conventional theory of economic forecasting, which relied closely on two key assumptions (originated by Klein et al in the 1970s); namely, the model used should be a good representation of the economy, and the structure of the economy would remain relatively unchanged. He remarked that empirical experience in economic forecasting in the past few decades showed that these conventional assumptions might not necessarily lead to good forecasting performance. Therefore, he delivered two new assumptions: models are simplified representations that are incorrect in many ways, and economies both evolve and suddenly shift.

With these new assumptions, he derived a number of sources of forecast errors, including shifts in the coefficients, mis-specification, mis-estimation, mis-measurement of the data, changes in the variance of the errors, etc. He then discussed the role of various

approaches used in forecasting that cause these errors, and ways to minimize these errors if possible. He also discussed the role of forecasting in selecting econometric models, stating that forecasting success might not be a good index for model selection and certainly should not be used for selecting policy models. The areas he pointed out for further research included pre-testing for intercept corrections, modelling shifts, forecasting smoothing, pooling of forecasts, leading indicators, etc.

The well-prepared lecture and the speaker's lucid presentation received accolades, and the lecture was followed by some comments and exchange of views. In his comments, Mr. Pingfan Hong of the United Nations pointed out that in the long list of the causes of forecasting errors, the speaker might have ignored an important area: the feedback effects of the forecast on the forecasting performance. He mentioned that, as a special feature of economic forecasting (in comparison with other predicting endeavours, such as weather forecasting), "we are forecasting variables in a system we are living in and making changes to." If a forecast of recession is made public, policymakers and other economic agents may act to prevent it, and thus make the original forecast incorrect. Mr. Hans Timmer of the World Bank commented that, for many institutional forecasters, policy scenarios were more important than the specific forecasts, and the accuracy of the forecast might not be their (only) objective. On the point made by the lecturer that a simple time-series model might be superior to a large structural model in forecasting competition, Professor Steven Hall reminded the audience that the lecturer by no means was against structural modelling—on the contrary, he was a proponent of structural modelling, but for the purpose of policy analysis, rather than for pure forecasting accuracy.

4. PRODUCTIVITY AND OTHER SUPPLY-SIDE ISSUES

Ignazio Visco (Banca d'Italia, Rome), formerly the Chief Economist at the OECD and now at Italy's central bank, summarized in his paper—*Total Factor Productivity Growth in the United States and Europe*—the major findings of a four-year investigation at the OECD into understanding productivity performance in the United States and Europe, as well as Japan. Rather than looking at the new economy debate, the focus of the study, which will be published in full in January 2003, is on why growth rates differ over time and why they differed by comparing total factor productivity (TFP) performances over two decades (1980-2000). The OECD team set about this task by following a number of alternative inquiries once the basic data set for the majority of OECD members (as of 1980) was assembled according to a common methodology.

The first focus was on growth accounting. The investigation confirmed that the United States grew faster and benefited from larger gains in TFP than Europe. But the standardized data showed growth rates of TFP that were well below those touted at the height of the new economy debate. The quality, and especially the utilization, of labour were crucial determinants of TFP performances. Higher gains were registered in countries with extensive ICT activities (notably, Australia, Canada, Finland, and the United States). The investigating team also sought to establish from the data embodied technical progress

separately from other TFP gains, and the results on the whole confirmed the earlier ones, making the contrast between the United States and Europe even more pronounced.

The second approach involved the estimation of growth equations, essentially panel regressions for 21 OECD countries for the period 1971-1998. Countries' performances differ depending on business investment, R&D expenditures, the role of the state (including tax burden), financial developments (including stock-market capitalization), macroeconomic stability, and trade openness.

A third approach focused on preparing productivity and growth estimates by sector via cross-country and cross-industry regressions for 1984-1994. The regulatory regime, competition, R&D, and trade openness were deemed to be especially important. Among the latter, labour-market protection at a high and low level was positive for growth; but at a medium level it worked out negatively.

Finally, the study also has a component with firm-level data harmonized for ten OECD countries. Labour productivity gains within firms were very important, followed by reallocation of resources within the same sector. Also firm demographics, including labour turnover and expansion of the labour force within the surviving firm, were conducive to labour productivity gains, with the largest being registered in the United States.

In conclusion, the presenter argued that growth disparities widened substantially over the time periods studied due to the "utilization" of labour. ICT has risen markedly in some countries. New investment has furthered technological change, which is visible notably in the United States, but much less so in the EU and Japan. Capital formation remains crucial to underpinning growth and TFP gains. This is especially critical in human and knowledge capital, which need to be encouraged through appropriate policies. Public investment of the right kind can play an important supporting role here.

Four additional papers were presented at the conference. *Euro Area Production Function and Potential Output: A Supply Side System Approach* (by Alpo Willman, ECB), *The Productivity Surge of the Nineties and Future Growth* (by Robert Coen [Northwestern University] and Bert Hickman [Stanford University]), *Cross-Country Evidence on Banking Crisis, Growth, and Total Factor Productivity* (by Chin Hee Hahn, KDI, Seoul) and, *Impact of Information and Communication Technology Capital on Labor Productivity: A Complete Macroeconomic Framework* (by Julien Deroyon, Cédric Audenis and Nathalie Fourcade, INSEE, Paris). These papers are all available at the LINK website.

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Annex A: Agenda

Project LINK Fall Meeting

October 7-11, 2002
Università di Bologna
Piazza S. Giovannni in Monte 2 , Aula Giorgio Prodi
Bologna , Italy

Agenda Outline

Sunday, October 6

Welcome Reception

Monday, October 7

Session I: World Economic Outlook
Session II: World Economic Outlook (cont.)
Session III: Regional Outlook and Policy Issues: North America and Japan
Session IV: Global Economic Trends

Tuesday, October 8

Session V: Regional Outlook and Policy Issues : Europe
Session VI: Regional Outlook and Policy Issues : Africa, Asia, and Latin America
Session VII : Developing Country Policy Issues I
Session VIII: Developing Countries Policy Issues II

Evening: Conference Dinner

Wednesday, October 9

Excursion

Thursday, October 10

Session IX: Monetary Issues in the European Union
Session X: Structural Policy Issues in Europe
Session XI: Lawrence R. Klein Lecture in Forecasting
Session XII: Modeling Techniques I

Friday, October 11

Session XIII: Productivity I
Session XIV: Productivity II
Session XV: Modeling Tecniques II
Session XVI: Macroeconometric Models

Agenda

Sunday , October 6

20:30 **Welcome Reception , Piazza S, Giovanni in Monte 2, Aula Giorgio Prodi**

Monday, October 7

9:30 **Welcome**

Professor Pierugo Calzolari
Rector , Università di Bologna

9:40-11:00 **World Economic Outlook**
Chair: Bert Hickman

"Project LINK World Outlook"
Jozef van Brabant., United Nations, New York

"The World Bank Global Economic Prospects"
Hans Timmer , The World Bank, Washington

"The OECD International Economic Outlook"
Pete Richardson, OECD, Paris

11:00-11:15 **Break**

11:15-12:45 **World Economic Outlook (cont.)**
Chair: Duncan Ironmonger

"The NIESR International Economic Outlook"
Ray Barrell, NIESR, London

"The Determinants of World Oil Prices : Does OPEC Matter?"
Robert Kaufmann , Boston University

"Non-Oil Commodities"
Robert Kaufmann , Boston University
F. Gerard Adams , Northeastern University

12:45-2:15 **Lunch**

2:15-3:45 **Regional Outlook and Policy Issues : North America and Japan**
Chair: Carlo D'Adda

"The US Outlook"
Lawrence R. Klein , University of Pennsylvania

"The Japanese Outlook"
Kanemi Ban , Osaka University

General Discussion

3:45-4:00 **Break**

4:00-5:30 **Global Economic Trends**
Chair: Adolfo Castilla

"An Indicator-Derived Primer on the Upcoming Quarters : Risks of Global Stagnation vs. Chances of Recovery"
Carl Weinberg, High Frequency Economics , New York

General Discussion

Tuesday, October 8

9:30-11:00 **Regional Outlook and Policy Issues: Europe**
Chair: Thomas Wilson

"Europe: Summaries"
Peter Pauly , University of Toronto
Franjo Stiblar , University of Ljubljana

General Discussion

"Choosing the Rules – Fiscal and Monetary Frameworks in Europe"
Ray Barrell , NIESR , London

11:00-11:15 **Break**

11:15-12:45 **Regional Outlook and Policy Issues : Africa, Asia, and Latin America**
Chair: Anna Stagni

"Developing Countries: Summary"
Peter Pauly , University of Toronto

General Discussion

"Information Technology Trade and Asia-Pacific Interdependence"
Byron Gangnes , Ari Van Assche, and Carl Bonham , University of Hawaii

12:45-2:15 **Lunch**

2:15-3:45 **Developing Country Policy Issues I**
Chair: Giorgio Basevi

"East Asian Crisis and Contagion : The Case of India"
Pami Dua , Delhi University

"Markov Regime Switching Models of Currency Crises in Southeast Asia"
Roberto Mariano, Augustine H.H. Tan, Celso Brunetti, Chiara Scotti , University of Pennsylvania and Singapore Management University

3:45-4:00 **Break**

4:00-5:30 **Developing Country Policy Issues II**
Chair: Charlotte du Toit

"The NAIRU, Unemployment, and the Rate of Inflation in Brazil"
Elcyon Caiado Roche Lima , IPEA , Rio de Janeiro

"Ghana : Aggregate Supply Growth Models and Policy Implications"
Cletus Dordunoo , ClayDord Consult , Ghana

Wednesday, October 9

Full – Day Excursion

Thursday, October 10

9:30-11:00 **Monetary Issues in the European Union**
Chair: Paolo Onofri

"Saving and Investment in Euroland, the EU, and the Enlarged EU"
Gianpaolo Rossini and Paolo Zangheri , Università di Bologna and CEPII, Paris

"Exchange Rate Pass-through and Real Exchange Rate in EU Candidate Countries"
Zsolt Darvas , Bank of Hungary , Budapest

11:0-11:15 **Break**

11:15-12:45 **Structural Policy Issues in Europe**
Chair: Massimo Tivegna

"The Impact of Ownership on the Performance of Micro Units : Comparison Between EU Members and Candidates"
F*ranjo Stiblar , University of Ljubljana*

"The Pension Reform in Italy and Its Effects on the Propensity to Save"
Paolo Onofri , Università di Boilogna

12:45-2:15 **Lunch**

2:15-3:45 **Lawrence R. Klein Lecture in Forecasting**
Chair: Peter Pauly

"Economic Forecasting : Some Lessons From Recent Research"
D*avid Hendry, Oxford University*

3:45-4:00 **Break**

4:00-5:30 **Modeling Techniques I**
Chair: Renzo Orsi

"Rational Expectations and Near Rational Alternatives : How Best to Form Expectations"
Steven Hall , Imperial College , London

"Correcting Taylor Rules for Forecast Biases"
Heinz Glück , Stefan P. Schleicher, and Rosaria Catena , University of Graz and Austrian National Bank , Vienna

Friday, October 11

9:30-10:30 **Productivity I**
Chair: Mette Rolland

" Total Factor Productivity Growth in the United States and Europe"
Ignazio Visco , Banca d'Italia , Rome

10:30-10:45 **Break**

10:45-12:45 **Productivity II**
Chair: Alexander Welfe

" Euro Area Production Function and Potential Output : A Supply Side System Approach"
Alpo Willman , European Central Bank , Frankfurt

"The Productivity Surge of the Nineties and Future Growth"
Robert Coen and Bert G. Hickman , Northwestern University and Stanford University

"Cross-Country Evidence on Banking Crisis, Growth, and Total Factor Productivity"
Chin Hee Hahn , KDI , Seoul

12:45-2:15 **Lunch**

2:15-3:45 **Modeling Techniques I**
Chair: Pingfan Hong

"Real-Time GDP Forecasting in the Euro Area"
Alberto Baffigi , Roberto Golinelli , and Guiseppe Parigi , University of Bologna

"The Impact of Information and Communication Technology Capital on Labor Productivity : a Complete Macroeconomic Framework"
Cédric Audenis, Julien Deroyon, and Nathalie Fourcade , INSEE , Paris

3:45-4:00 **Break**

4:00-5:30 **Macroeconometric Models**
Chair: Muthi Samudram

"China Entering WTO : Interpreting the Issues Using the Chinese Annual Model"
Jean-Louis Brillet and Liu Xiaoyue , INSEE , Paris and National Bureau of Statistics, Beijing

"The MICMAC Model for Sweden"
M.K. Andersson, Johan Lindén, P. Lundvik , NIER , Stockholm

"Growth Determinants of Economic Potential"
Wladyslaw Welfe , University of Lodz

5:30 **Meeting Close**

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