



**The Kiel Institute for World Economics**  
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## **The Kiel Institute for World Economics**

### **Past Activities**

The Institute's central area of research is the international division of labor from a static and dynamic point of view. The Institute analyzes the sectoral and spatial allocation of goods, services, and factors of production. The endowments of countries, including the environment, the changes of these endowments over time, and the international interdependencies between monetary and fiscal policies and between business cycles of various countries are investigated. In analyzing these phenomena, special emphasis is given to the consideration of institutional settings in national as well as international terms and to the incentive and political economy systems that are part of these settings.

The main activities of the five research departments are in following areas:

The research program of the [Growth, Structural Change, and International Division of Labor Department](#) centers around the division of labor in the world economy and related structural adjustment processes in highly developed, internationally open economies. In particular, the transition from the industrial economy to a service and information economy, with its implications for employment and institutional settings on the labor market, are analyzed. Special emphasis is laid upon the impact of European integration.

Research activities in the [Environmental and Resource Economics Department](#) focus on the allocation of environmental and natural resources. The factors influencing the increasing scarcity of natural resources are investigated and their impact on the allocation of factors of production and goods in the world economy is assessed. Natural resources encompass energy resources, nonenergy raw materials, environmental quality, and biological diversity. Both the intertemporal aspects of increasing scarcity and the allocation of scarce natural resources are the subject of research activities in the Department. National as well as international aspects of environmental policy and allocative as well as distributional effects are analyzed and efficient and rational policy instruments are developed.

The [Regional Economics Department](#) focuses on spatial perspectives of the international division of labor and its implications for economic growth and development. It analyzes how centripetal and centrifugal as well as integrating and disintegrating forces are shaping the spatial division of labor. Hence, the analysis of patterns of regional specialization, interregional trade, regional growth, and appropriate regional governance structures figure high on the Department's research agenda.

In the [Development Economics and Global Integration Department](#) research is principally targeted toward identifying the prerequisites for the successful integration of developing countries, emerging countries, and transformation countries into global and regional goods and factor markets, as well as toward analyzing the determinants and implications of differences in the speed of economic growth between these countries.

The [Business Cycles Department](#) analyzes and forecasts the cyclical development in the world economy, with a particular focus on Germany, the euro area and other industrial countries. The Department uses several data bases which are permanently updated by adding

national and international data from official and nonofficial sources. Further, it uses new theoretical developments which may enhance the analysis of the macro economy. In addition, modern econometric methods are used to improve the empirical basis for the forecasts and the assessment of economic policy.

In addition to the five research departments there is a separate [Research Area "International Financial Markets"](#). It focusses on the integration of financial markets and the structure and determinants of international capital flows. Special attention is paid to the effects of financial market volatility in developed and emerging markets and their repercussions on other sectors of the economy.

## Future Activities

### Program 1: Globalization and Growth

#### International Trade and Investment (ITI)

The research theme considers topics related to international trade and investment, thereby emphasizing empirical aspects. Research is structured into four broad issues, namely international integration and factor incomes, private capital flows (FDI) and growth, public capital flows (foreign aid) and development, and patterns of specialization in a growing world economy. Major questions for research concern the interaction between economic growth and international integration through trade and capital flows. The specific research projects aim at an improved understanding of

- (i) the consequences of globalization for wages and human capital formation in countries within different cones of specialization,
- (ii) the probably different effects of various forms of inward FDI on (transitional) growth and on the distribution of income,
- (iii) the determinants of the allocation of foreign aid, including the presumed quality of governance in recipient countries, and the growth effects of various forms of foreign aid, and
- (iv) the pattern of specialization in an integrated world economy that is driven by sector- and factor-biased growth.

Short descriptions of current and planned projects are attached.

Research carried out under this theme will be used to initiate a virtual research community "International Trade and Investment" that will become a part of the planned Virtual Research Center DEGIT. Organizing the Virtual Research Community International Trade and Investment and managing the Virtual Research Center DEGIT are understood as related public goods activities, which also require personnel resources.

#### Agglomeration and Growth in Knowledge-Based Societies

In modern societies the creation, diffusion and application of new knowledge are among the most important engines of economic growth. However, knowledge-intensive (and high income) economic activities such as R&D, headquarter functions or finance are not evenly distributed over geographic space, but show a high propensity to cluster, often at a supranational or even global scale. As these agglomerations tend to gain in importance as principal drivers of innovation and growth in national economies, there is growing concern that existing disparities in knowledge potential, income and growth may widen. Peripheral locations or even whole countries without an outstanding center may lose competitiveness in knowledge-intensive activities and fall back in economic strength and welfare.

Against this background, the main purpose of the proposed research area is to describe and analyse the ongoing spatial concentration of knowledge-intensive activities and to investigate its micro- and macroeconomic causes and consequences. We will, in particular, pursue four major **research objectives**:

- Describing the location (and co-location) patterns of knowledge-intensive industries in Europe.
- Analysing the relationship between agglomeration and growth with particular reference to knowledge spillovers.

- Analysing the role of the spatial and institutional context for knowledge creation, knowledge-exchange and the access to knowledge spillovers.
- Investigating policy-options to promote growth and cohesion in knowledge-based societies.

## **Globalisation and Structural Change**

### **Motivation and Social Relevance**

The process of globalisation is characterised by declining distance costs — both in a geographic and in a virtual sense – which have spurred global and regional economic integration thus generating gains from trade, specialization, and scale economies. At the same time, trade-related structural change entails adjustment pressures and, hence, pains for those who have to adjust to new price relations, giving losers incentives to call for compensation. Moreover, trade integration comes along with increasing flows of direct investments (“off-shoring” and “outsourcing”) having a direct impact on the composition of the international division of labour and the process of structural adjustment in industrialised countries. Assessing the significance of gains versus pains and identifying the winners and losers from trade-related structural change are the major prerequisites for any kind of economic policy which aims at smoothing excessive adjustment costs. Accordingly, we intend to design policy instruments which are adequate to compensate the losers of structural adjustments without compromising the gains from globalisation and economic integration.

### **Research Issues**

Distance as a determinant of trade integration — In how far and to what extent do different types of distance costs shape trade patterns and what are ensuing consequences for structural change?

The intensity of almost all kinds of economic interaction rapidly falls with increasing distance (Venables). Trade integration as a result of a dismantling of trade barriers, however, will not necessarily lead to a homogeneous economic space with equalized economic relations across the board. Instead, it can be expected to result in a heterogeneous network of trade relations differing by intensity, and governed by specific determinants which can be subsumed under the heading of distances/proximities. Relevant dimensions of distance shaping regional and sectoral trade patterns go far beyond usual geographical distance (transportation costs) and include virtual ones, such as economic, administrative, linguistic, historical and cultural distances. Research objectives in this context are to identify the specific distance-related determinants of trade integration and their respective impacts, to elaborate regional centres of gravity with respect to export and import flows of the members of the integration area and to explain the integration patterns resulting from the interplay of various kinds of distance. Currently these questions are addressed in a project on integration patterns to emerge from the Eastern enlargement of the European Union.

Integration and the spatial division of labor — What centripetal and centrifugal forces are unleashed by declining distance costs, what polarization processes do they trigger off, and what disparities among industries and locations result from this?

Against the theoretical background of the “new economic geography” it is intended to provide empirical evidence about the relationship between industrial location, regional specialisation and regional performance in the context of European integration and enlargement. These findings will help to identify potentially winning and losing regions. A specific task is to examine the experience of current EU member states with integration in general and with previous enlargements in particular, in order to apply the results to new accession rounds. The challenges from enlargements will be identified and recommendations to regional policy at the European, national, and local level will be submitted.

Intra-industry trade and occupational change — Within industries at given locations, are adjustment pains confined to traditional skills, or are they even felt in advanced occupations which were considered being rather safe so far?

As a result of falling distance costs that enable firms to realize economies of scale in producing differentiated goods, the division of labor between advanced countries is mainly driven by intra-industry specialisation. According to traditional Neo-Chamberlain (Dixit, Stiglitz; Krugman; Dixit, Norman) and Neo-Hotelling (Lancaster; Helpman) theories of intra-industry trade, adjustment pressures on labor markets resulting from intra-industry trade are relatively weak. Since these theories

define intra-industry trade as trade in horizontally differentiated goods that are produced with similar factor intensities, relative factor incomes and employment structures are assumed to be not affected by intra-industry trade. This theoretical conclusion gave rise to Balassa's famous "smooth adjustment hypothesis" stating that adjustment costs stemming from intra-industry trade are much lower than those resulting from inter-industry specialisation. Against this background, empirical work will focus on the use of innovative methods for measuring intra-industry trade and on the analysis of the structural impact of intra-industry trade in industrialised countries such as pressures for occupational change.

Globalisation of production: What are the major determinants of outsourcing and off-shoring? Traditional trade theory stresses the importance of exploiting international factor price differentials, whereas the theory of the multinational firm points to the exploitation of firm-specific scale economies resulting from the provision of headquarter services. The relevance of these different theoretical approaches needs to be evaluated by a careful empirical investigation of the sectoral and regional patterns of foreign direct investment and of intra-firm trade in intermediate goods. The analyses aim at a better understanding of the evolution of international production networks and their implications for labor market adjustment in highly developed countries.

## **Beyond Europe – External Dimensions of Integration**

The process of EU integration is a unique experience of simultaneous integration deepening and widening. It creates a fertile platform for empirical research on regional integration which, potentially, provides lessons for other regional integration initiatives. This is especially relevant in the light of mushrooming regional groupings all over the globe sometimes characterized as the spaghetti bowl phenomenon. Second, European integration has an impact on non-member states in Europe and other regions. This does not only refer to the direct effects of external discrimination but also to indirect effects arising from the growth impact of EU integration on third countries. Research activities on this broad topic are focused on trade, monetary and institutional issues and contribute to building an international research network.

On the trade issue, conditions of market access for third countries after the enlargement and the net gains for these countries following integration widening are subject to analyses. (1) The few CGE based studies assessing the third country trade implications of widening the EU free trade area show only small losses for third countries but neglect both deep integration steps from the customs union stage onwards as well as the influence of new member states on sectoral change and the future trade policy of the EU. (2) The service sector also received not much attention although the EU is not yet a complete customs union in this sector and remnants of EU member states' competences prevent third countries from benefiting from a single market. (3) Ambitious endeavors such as the Lisbon 2010 target will have third country implications with respect to trade and especially factor flows. As concerns the methodology, there is an ample scope for CGE work, partial equilibrium analyses and policy-targeted case studies.

On the monetary issue, the prospective widening of the EMU toward the new member states as well as unilateral euroization and lessons for other regional initiatives in Asia, Africa, and Latin America are analyzed. (1) The optimal monetary integration strategy given alternative real and financial integration scenarios is an empirical question which should be addressed by assessing the impact of macroeconomic instability in alternative integration scenarios in the EU, in its neighborhood, and in other regions of the world. (2) Given that exchange rates matter for small open economies, the role of (real) exchange rates as a target for monetary policy in inflation targeting regimes and the choice of exchange rate anchors has to be determined on the basis of a dynamic three-country macro model. (3) Assuming that exchange rates matter, the driving forces behind equilibrium real exchange rate changes under different currency regimes and policy frameworks warrant more research.

On the institutional issue, the aim is to produce an analysis of convergence for countries outside the EU towards EU benchmarks, measuring "how far from Brussels" they are. (1) The process of EU enlargement is tightly bound to the concept of convergence, as membership to the EU demands the fulfilment of a series of political, legal, and economic criteria which all include institutional aspects to a considerable extent. (2) Beyond any EU Accession or Association perspective, emerging market economies will also benefit directly from institutional development. The tools to assess institutional development will be a set of country studies on the basis of aggregated and individual indicators in order to develop comprehensive qualitative and statistical analyses of the level of institutional development in all European countries and countries covered by the Wider Europe Initiative.

In cooperation with the Johns Hopkins University Bologna Center, a web-based research center BECORS (Beyond Europe Center On Regional Studies) is to be developed which intends to organize policy oriented research on European integration, its third country effects as well as on potential lessons from European integration. The intention is to form a research community on regional integration issues. A first project is to take stock of the major operational regional initiatives around the world by asking whether their performance would have been different if lessons would have been taken from European integration. The research center BECORS may also act as an outlet of European focused research at the Institute.

## **Program 2: Public Goods and Public Policy**

### **Reforming the Welfare Society**

The research theme has two main foci: (i) measuring economic incentives generated by welfare policies and (ii) deriving the behavioral implications of these incentives.

Welfare policies are to be defined broadly, to include the following areas: employment, skills, pensions, and health policies.

The theme aims to examine the effectiveness of policies from the perspective on economic efficiency (absence of waste) and equity (redistribution).

The research will cover both existing policies and reform proposals.

This theme is socially important because (a) welfare policies play a vital role in providing social insurance, life-cycle transfers, redistribution and a variety of social services and (b) there is good reason to believe that current policies often do this ineffectively and inefficiently. Governments and the general public could benefit from guidance on how the incentives generated by these policies could be improved, in order to better achieve their ends at lower cost.

The research will initially focus on Germany. The medium-term aim is to build an international research network, so that welfare policies in different countries may be compared and indications of best practice be established.

### **Climate and Energy**

There is now strong evidence that greenhouse gas (GHG) emissions have a lasting effect on the global climate system and first evidence of climate change has also been observed. The problem of climate change has two characteristics which makes it an important issue for the world economy: First, since GHG emissions are mainly produced by the burning of fossil fuels they are closely linked to the structure of the energy supply and more importantly there is a close relation between economic activity and GHG emissions. Second, it is irrelevant where in the world GHG emission are released so that climate change is a global problem. In the United Nations Framework Convention on Climate Change (UNFCCC), the international community of states has committed itself to "prevent a dangerous anthropogenic interference with the climate system". In the long term, the challenge is to decouple energy supply from its dependence on fossil fuels. In the short and medium term, the point is to slow down the growth of energy related greenhouse gas emissions and to create incentives for alternative, less energy intensive production and consumption.

The research theme "Climate and Energy" will concentrate on the complex interaction of energy demand, the supply of exhaustible fossil energy and climate goals. In particular, it will take into account the fact that the economies in the different regions of the world differ considerably with respect to their technologies and their energy intensities. Climate policies can utilize these differences by improving energy efficiency and promoting GHG reductions at the same time through several means such as technology transfer, emissions trading etc. Since future GHG emissions will primarily grow in the developing world while the potential for innovation in the energy sector is primarily found in the industrialized countries a challenge is to frame the process of technological diffusion of energy efficiency improvements and non-fossil energy technologies from the industrial to the developing countries. Finally, important strategies for a global carbon management (renewable energy,

sequestration of carbon dioxide, emission reductions in agriculture) are closely related to land-use issues, which will be treated in the research theme “climate and energy” as well.

Important research questions include

- What are the economic impacts of different policies for controlling greenhouse gas emissions on the national and international allocation of goods and factors?
- What is the role of innovation and technology transfer in the energy sector in national and international climate policies?
- What are the factors that determine the development and use of non-fossil, alternative energy?
- What are the land-use conflicts that can be expected as a result of global carbon management and how can they be solved?

### **Poverty Reduction, Equity and Development (PRED): Research Agenda and Projects**

The goal of halving world poverty by 2015 is one of the Millennium Development Goals set by the members of the United Nations. Accelerated economic growth in developing countries is widely viewed as a prerequisite for achieving this goal because most countries that managed to reduce poverty did so during periods of rapid economic growth. However, the degree to which economic growth has reduced poverty differs considerably across countries and over time. This observation has given rise to the concept of pro-poor growth. In this proposed research theme, the overarching question is “How to achieve pro-poor growth?” Answering this question requires a detailed analysis of the interactions between growth, poverty, and income distribution. In doing so, we focus on three subsets of issues: first, the role of agricultural growth and rural development in poverty reduction, with a particular emphasis placed on the income generation process at the household level; second, the challenge of allowing the poor to benefit from natural resource wealth, taking into account both economic constraints (e.g. the enclave character of resource industries; macroeconomic instability due to volatile prices) and political forces (e.g. rent capture by powerful interest groups) that might prevent pro-poor growth; and third, the contribution of remittances to growth and poverty reduction. To contribute to knowledge in these three areas, we combine micro-level analyses based on household data, such as microsimulations, with macro-level Computable General Equilibrium (CGE) models.

### **Environmental Policy Instruments**

Many environmental resources cause allocation problems since non-rivalry and non-excludability in their use lead to market failure. The internalization of these external effects is a central challenge of national and international environmental policy. For the control of local environmental problems, national authorities can revert to different sovereign regulations. In the case of cross-border and global externalities, environmental policy is confronted with larger challenges, as there is no supranational authority that can enforce the appropriate policy mix. For both the national and international level, a targeted use of environmental policy instruments requires substantial information about complex interactions between the ecological and economic system. Accordingly, the choice of optimal environmental policy instruments is ideally based on interdisciplinary research.

In environmental policy, a number of different instruments are available that stimulate different reactions. The instruments differ with respect to their economic efficiency, ecological effectiveness, distributional effects, their administrative feasibility and their political acceptance. The research on environmental policy instruments will connect economic theory with the need for an application-oriented choice of policy measures and focus on the consideration of the different goals mentioned above. Furthermore, environmental policy instruments are just one part of an extensive regulatory framework. The conflicts among different political objectives, the deliberate and accidental interactions among policy instruments, and finally the search for the optimal policy mix will constitute the focus in this research theme.

Important research questions include What are the allocation and distribution effects of new market-based environmental policy instruments?

- What is the role of information (e.g. by eco-labels) in environmental policy?
- How can global environmental problems be controlled by cooperative mechanisms?

- How can environmental policy instruments account for the complex interactions between different environmental media?
- How can different instruments be linked to ensure an effective use of the environment in the case of multiple objectives?

## **The Global Health Economy: Understanding Policy Priorities for the 21st Century**

In this research theme, we plan to study the emerging global health economy in which a purely national health policy can be no longer fully effective, nor efficient. We plan to build an international research network whose primary focus will be the impact of globalisation and technological change on health-related consumer behaviour, the adoption of health care technologies and the practice of medical decision making. The objective is to improve our understanding of how private and public investments in health can be made more efficient, of how access barriers to knowledge and new technologies can be reduced and of how the global health economy can be turned into a potent driving force of economic development, growth and convergence of living standards in the 21st century. We believe that health economics can help to identify the best policies to square efficiency with equity in access and opportunity and that our research focus will have a large and lasting payoff to society.

We expect to contribute new knowledge that will help **1.** to improve the informational basis for policies aiming to influence health-related consumer behaviour; **2.** to forecast the demand for health care and for health insurance in a more reliable way than mere generational accounting exercises can; **3.** to identify new opportunities and constraints for health care reform in Germany; **4.** to explore the opportunities of European integration for health care and health insurance markets; **5.** to inform on WTO policies with regard to trade-related intellectual property rights, trade in health-related products, such as foods and pharmaceuticals, and trade in health insurance services; and **6.** to improve our understanding of innovations in financial markets so that their large unexploited opportunities for sharing health-related risks within and across countries can be exploited and a new role for supervisory and regulatory authorities can be identified and discussed.

In the following, I will first describe the parts of this research programme that will be carried out by researchers at the Kiel Institute and then go on to outline parts of our external partners' research plans. The theoretical part of our Kiel-based research aims to develop a unifying framework that recognizes the inter-temporal dimension and the inherent uncertainty and irreversibility of many health-related decision problems that consumers, medical practitioners, suppliers of new medical technology and regulators face. Modern investment theory provides the tools to understand problems of this kind, but is still waiting to be applied to health-related consumer choices, medical decision making and technology adoption. Indeed, the medical literature is still dominated by Pauker and Kassirer's essentially static cost-benefit model of medical diagnosis which cannot handle the most interesting issues that arise in a dynamic context.

In order to develop and exploit the implications of modern investment theory, our research will focus on three interrelated sets of research questions: **1.** How can we design institutions that help to implement Bayesian decision making in health technology assessments and in the regulation of biomedical research and technology adoption – so that a national health system can develop in accordance with a society's pre-agreed priorities, preferences and long-term needs? **2.** What are the implications of the real option theory for medical decision making? What is the relevance of this theory to the management of individual patients, to the design of disease management programs and to the adoption, assessment and development of new medical technologies? **3.** What are the implications of incomplete contract theory for the design and management of efficient health insurance amid rapid technological change in medical practice?

On the basis of this theoretical groundwork, we plan to address a number of urgent policy issues facing the European Union, the WTO and other global players in the near future. Priority will be given to the following five. **1.** Efficiency in medical research: What is the optimal mix of intellectual property rights and other incentive mechanisms? How can an efficient system of financing health care and medical research be achieved? What can we learn from international comparisons? – **2.** International trade in pharmaceuticals: How can global efficiency be achieved and defended against national interests and free-riding behaviour? Should there be an international agreement on pharmaceutical price regulation and what would be its impact on international trade? How can international trade

promote equal access to new medical technologies? What is the relationship between national health technology assessments and international trade? – **3.** Global public goods in health care: What are they and how can the efficient provision of global public goods be organized? How can international risk sharing opportunities in health care finance be exploited? – **4.** European integration: How can European integration promote the development of more efficient national health systems and the exploitation of economies of scale in the development, assessment and adoption of new medical technology? What can national governments or the European Union do to improve quality in health care? How can new technological opportunities to create health systems with a much greater intensity of information usage and more efficient arrangements of risk allocation be exploited? Can centres of excellence be in conflict with equal access? – **5.** Economic growth in aging societies: How important is the empirical contribution of increases in longevity and the quality of life and what exactly drives these increases? How do we need to redefine the concept and the measurement of economic growth as the quality of life and additional life years, produced by the health system, become increasingly valuable to consumers in the aging societies of the 21st century?

### **Program 3: Macroeconomic Activity and Financial Markets**

#### **Analysis and Forecasts of Global Income Cycles and Trends**

Giving a clear picture of recent national and international macroeconomic developments and offering well-founded forecasts is an important part of policy advice and essential in the institute's ambition to participate successfully in the academic as well as in the public debate on economic policy. An important aspect in this context is separating cyclical movements in output from long-run growth which helps to focus on the longer-run aspects of policy making.

One part of the research program comprises the regular preparation of forecasts for the world economy, the euro area and Germany, including the assessment of the cyclical situation and the evaluation of monetary, fiscal and structural economic policies from a macroeconomic perspective. In addition, important current issues of relevance for the outlook or economic policy orientation will be addressed in a timely fashion. Another part of the program focuses on the identification and analysis of secular trends. Work in this area currently include such medium term issues as the repercussions of rapid growth in China and India, inflation differentials in the euro area, or the influence of labor market institutions on potential output growth. Finally, research projects are carried out that aim at improving the tools and methods of forecasting and analysis.

#### **Fiscal Policy in the Global Economy**

Increasing economic integration of the world economy and its implications for the design of macroeconomic policies has been an active area of research at the Kiel Institute for a long time. National governments as well as supranational bodies such as the ECB or the European Commission are faced with formidable challenges arising from ever-stronger linkages among national goods, factor and financial markets. There is, thus, a large and growing demand for policy advice as concerns the macroeconomic aspects of globalization. At the same time, recent research in international macroeconomics has highlighted that many questions in this area are far from being settled (see, e.g., Obstfeld and Rogoff 2000 and Ambler et al. 2004).

While there is already a large literature on the international transmission of monetary policy, there is little work on the international transmission of fiscal policy. Therefore, we plan to concentrate on the fiscal side of international policy transmission and to contribute to knowledge in this area. Our research will cover the following fields: First, we will study fiscal policy transmission among large currency areas both from an empirical and from a theoretical perspective, with a special focus on the United States and the euro area. Second, we will address the normative question of whether there is a need for international policy coordination, again with a focus on the United States and the euro area. Third, we will address the need for policy coordination inside the euro area, taking into account the special institutional framework underlying EMU (one monetary policy, many fiscal policies).

Our reading of the literature suggests that there is ample room for additional empirical work in this area since so far there are only a few well-established stylized facts. We plan to use advanced

econometric techniques such as vector autoregressive models and dynamic panel data models to study the international transmission of fiscal policy shocks. In order to be able to give sound policy advice we need to construct theoretical models that are (i) data consistent and (ii) suitable for the evaluation of alternative policies. The first aspect highlights the importance of an interaction between empirical and theoretical research in the research theme. In this respect, empirical research serves two purposes: first, to provide stylized facts against which competing theoretical models can be evaluated, and, second, to estimate the structural parameters of theoretical models. Stochastic dynamic general equilibrium (SDGE) models and especially models belonging to the New Open Economy Macroeconomics (NOEM) initiated by Obstfeld and Rogoff (1995) provide the appropriate methodological framework for our research. SDGE models rely on a rigorous microeconomic foundation and, with that, allow for an analysis of the welfare effects of alternative economic policies. For example, these models permit to investigate the case for international policy coordination or, on a regional level, for fiscal policy cooperation in the euro area.

### ***Monetary Policy under Data Uncertainty***

Monetary policy is of central importance for the well-being of an economy. Generally, it is designed to maintain low and stable inflation rates but also support general economic conditions over the business cycle. In simple economic theories it is even possible that active monetary policy simultaneously stabilizes the inflation rate and the output gap. However, such a result presupposes, *inter alia*, that the macroeconomic variables which feed into the decision process of the central bank are measured with certainty. In practice, this condition is likely to be violated because the data collection and publication process of statistical agencies takes time and may be subject to measurement error. Typically, first releases of important variables like inflation and output growth are heavily revised in the subsequent months and quarters. Hence, if a central bank took first releases for certain, it would well be possible that it only reacted to data mismeasurement and, by this, caused excess inflation or recessions.

A natural starting point of the project is to quantify the data uncertainty of those variables which are central to monetary policy decisions. To this end, a model of real-time data generation is to be developed that allows estimating the variances of data revisions and decomposing them into measurement errors and information updates. An international comparison of the revision processes can shed some light on the question whether and, if yes, why there are differences between statistical agencies in different countries.

Based on these results, we want to ask how monetary policy should behave in an environment of data uncertainty. Optimal monetary policy rules can be derived in the framework of a simple macroeconomic model both under data certainty and data uncertainty. The difference between two such rules can be taken as a measure of how strongly data uncertainty affects monetary policy. Again, it will be informative to calibrate the real-time data generation process according to the empirical results obtained for different countries to obtain an indication in which countries the data uncertainty has the strongest implications for monetary policy. The results shall be confronted with empirical monetary policy rules estimated with real-time data for different central banks in order to find out how they deal with data uncertainty.

Given real-time data uncertainty, it shall be analyzed whether indicator variables such as survey measures of consumer and producer confidence which are readily available without revisions can mitigate the problem. This would be possible if such variables can predict future revisions and, thus, contains information which is not included in first releases. Similarly, the information content of variables like narrow money should be re-examined with real-time data. Even though money itself is subject to revisions, numbers are available more quickly and perhaps more accurate than, e.g., output numbers. In addition, the informational content of diffusion indexes estimated from large-scale real-time data panels shall be analyzed.

Fiscal policy is an important counterpart to, and may interfere with, monetary policy. For example, expansionary fiscal policy can endanger price stability and, hence, force a reaction of monetary policy. For this reason, it is also important to analyze the impact of data uncertainty on fiscal policy. While this seems less relevant than for monetary policy because fiscal policy is determined by many other, mainly political, factors, the current stance of the economy should still be an important aspect of fiscal forecasts and budgetary decisions, in particular for member countries of the European Monetary Union which have to adhere to the Stability and Growth Pact.

## The Phillips Curve Revisited

The research theme examines the relationship between the real and monetary sides of the economy. Particular emphasis is given to the relationship between inflation and money growth (on the one hand) and macroeconomic activities such as employment, unemployment, and national output (on the other). The theme covers the following topics from a theoretical and empirical vantage point:

- the impulse-response functions (IRFs) inflation and macroeconomic activities with respect to monetary shocks, with various dynamic properties,
- the influence of nominal rigidities, microeconomic objectives, and market structure on the IRFs above,
- the long-run relation between inflation and macroeconomic activities,
- optimal monetary policy, and
- the interaction between monetary and fiscal policy and its influence on the IRFs above.

The underlying aim of theme is to address the various difficulties of the New Keynesian Phillips Curve in accounting for well-known empirical regularities, such as the smooth and gradual adjustment of inflation and macroeconomic activities to monetary shocks and the usual absence of disinflationary booms.