

France: Selected Issues

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FRANCE

Selected Issues

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Approved by the European Department

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EXECUTIVE SUMMARY

The analytical work associated with the 2006 Article IV Consultation fits in a continuum of staff research exploring the policies France needs to pursue to enjoy higher growth with low unemployment, and to secure fiscal sustainability (see **Annex for an overview of staff research since 2000**). That growth-and flexibility-enhancing structural reforms in labor, product, and financial markets are key to meeting the challenges of aging and globalization is corroborated again in this year's research on the sensitivity of the French economy to global developments, the economic implications of welfare financing reform, and the role of new mortgage market instruments in alleviating household liquidity constraints.

Indicative of France's increasing international economic integration, common components explain an increasing share of its GDP fluctuations (**Chapter I: France in the Global Economy**). G-7 economic activity affects output relatively more through demand shocks, while the rest of the euro area's activity works more through supply shocks. Trade, relative prices, and FDI flows are relevant for the transmission of all shocks, while interest rates are more relevant for the transmission of demand shocks and consumer confidence and stock markets for supply shocks. Given the importance of exogenous shocks, the difference in the economy's response compared to Germany, and the fact that France is part of a currency area, there is a need for goods, services and labor to be made as flexible as possible.

With labor costs high, in part because of high payroll taxes and social security contributions, the question arises whether using alternative tax bases to finance welfare would lead to higher economic efficiency (**Chapter II: Economic Implications of Reforming Welfare Financing**). Theory does not deliver clear-cut results but evidence suggests that taxing consumption may be less distortionary than other forms of taxation. However, much would depend on whether workers are compensated for the purchasing power loss from higher consumption taxes. In the French context, with indexation of the minimum wage and social benefits and labor unions sensitive to their purchasing power, a shift from employer contributions to consumption taxes would have negligible effects. A shift to capital taxes would tend to have negative effects in the long run. The first best solution, therefore, seems to look for additional spending reductions to finance a cut in the tax burden on labor.

Household consumption in France is excessively sensitive to current income (**Chapter III: Liquidity Constraints and Mortgage Market Reform**). While cultural factors could play a role, differences with culturally similar European countries point to the likely importance of financial market imperfections, limiting access to credit for certain households. Indeed, in France it has been difficult to use real estate as collateral other than for a first mortgage. Recently introduced rechargeable mortgages still do not allow access to capital gains for loan collateral while reverse mortgages are unlikely to thrive in the absence of annuities markets; both will need to demonstrate their attractiveness vis-à-vis publicly administered schemes. A variety of additional reforms will be needed to foster efficient use of real estate collateral.

I. FRANCE IN THE GLOBAL ECONOMY¹

Objective: This study identifies the main shocks that cause fluctuations in economic activity in France and the channels through which France interacts with the global economy. For that purpose, it uses a large-dimensional structural approximate dynamic factor model.

Results: The paper contains three main findings. First, U.S. shocks, especially demand shocks, play an important role in explaining French economic activity as reflected in the share of the forecast error variance of the French variables they account for. Trade in goods and services, relative prices, and FDI flows are the main channels of transmission for all shocks. The stock market and the consumer confidence channels seem relatively more relevant for the transmission of supply shocks, while interest rates seem relatively more important for the transmission of demand shocks. Second, indicating France's increasing regional and global economic integration, the share of its GDP fluctuations explained by the common components has increased over time. G7 (excluding France) economic activity affects French output relatively more via demand shocks, while euro area (excluding France) activity affects it relatively more via supply shocks. Third, there is some tentative evidence of regional components, independent of the global common components, in explaining fluctuations in French economic activity. Finally, country-specific components also contribute.

Policy implications: Given the predominance of exogenous factors affecting French economic activity, the asymmetry in the transmission of shocks across countries—illustrated here by comparing French and German variables responses to U.S. shocks—and the fact that France is part of a currency area, French goods, services, and labor markets should be made as flexible as possible. By facilitating the adjustment of the economy to shocks, income volatility should fall and welfare increase.

A. Introduction

1. **Global developments affect the French economy significantly.** Standard sources of fluctuations in economic activity include economic developments in trading partners, monetary and exchange rate developments, oil price changes, domestic fiscal policy, ongoing structural reforms, and productivity shocks. Observers of the French economy note that a significant part of fluctuations in French economic activity can be attributed to external sources, though their transmission channels sometimes defy standard models. For example, French and German consumer confidence indices and French and U.S. business confidence indices exhibit significant comovement as do the national index of stock prices and the

¹ Prepared by Alain Kabundi (University of Johannesburg) and Francisco Nadal De Simone.

performance of the U.S. economy. Moreover, the role of foreign direct investment (FDI) seems sometimes downplayed in empirical work as a relevant additional link between French and U.S. activity.

2. **New statistical techniques allow a more reliable extrication of global factors and identification of the channels via which they interact with the French economy.** The main reason is that the new models allow the conditions to recover structural shocks to be satisfied more easily, in contrast to the often-used small-size structural VARs, where such conditions were unlikely to be met (Hansen and Sargent, 1991, and Fernandez-Villaverde, Rubio-Ramirez, and Sargent, 2005). Large dynamic factor models permit the exploitation of the wealth of information included in large panels (Forni, Hallin, Lippi, and Reichlin, 2000, and Kose, Otrok, and Whiteman, 2003) and a look inside the “black box” of factor models (Forni, Giannone, Lippi, and Reichlin, 2005). Accordingly, these factors can be related to economically meaningful shocks, and the type of large information sets that economic agents have access to can be taken fully into account. In this vein, two main novel approaches have recently been used: Eickmeier (2005) analyzed the transmission of business cycles from the United States to Germany; and Forni, Giannone, Lippi, and Reichlin (2005) revisited the VAR results of King, Plosser, Stock, and Watson (1991) to identify U.S. shocks on output, consumption, and investment.
3. **This paper continues and expands the staff’s empirical work on French business cycles.** Building on previous work using factor models to explain French economic activity and prices (e.g., Nadal De Simone, 2002 and 2005, and Kabundi, 2004), this paper follows Eickmeier’s (2005) framework and uses a sign-restriction strategy to identify the main shocks that affect the French economy and the channels through which it interacts with the global economy. This paper fits in three strands of the literature: first, it relates to the study of the cyclical comovement of activity among countries (e.g., IMF, 2001, and Montfort, Rennee, Rüffer, and Vitale, 2004); second, it is part of studies that explore the channels of transmission of economic shocks across countries (e.g., Kose, Prasad, and Terrones, 2003, and Imbs, 2004); and third, it contributes to the structural VAR literature (Lumsdaine and Prasad, 2003, and Eickmeier and Breitung, 2005) as the structural shocks are identified using that approach.
4. **This study contains three main findings.** First, U.S. shocks, especially demand shocks, play an important role in explaining French economic activity as reflected in the share of the forecast error variance of French variables they account for. Trade in goods and services, relative prices, and FDI flows are the main channels of transmission for all shocks. The stock market and consumer confidence channels seem relatively more relevant for the transmission of U.S. supply shocks, while interest rates seem instead relatively more important for the transmission of demand shocks. Second, indicating France’s increasing regional and global economic integration, the share of French GDP fluctuations explained by the common components has risen over time—a phenomenon also found in Germany. G7 (excluding France) economic activity affects French output relatively more via demand shocks while euro area (excluding France) activity affects French output relatively more via supply shocks. Finally, there is some tentative evidence of a possibly small role for regional components, independent of the global common components, in explaining fluctuations in French economic activity. Idiosyncratic components also contribute to the explanation of

French output fluctuations. Given the importance of exogenous factors for French economic activity and the fact that France is part of a currency area, French goods, services, and labor markets should be made as flexible as possible. This will reduce income volatility and increase welfare.

5. **This paper is organized as follows:** Section B discusses the model and the economic conditions for the identification of structural shocks. Section C explains the data, data transformation procedures, and the estimation technique. Section D discusses the econometric results on the source of the shocks and the channels of transmission. The last section discusses the policy implications of the paper.

B. Methodology

6. **The methodology used in this paper comprises two main steps:** First, an estimation of the common components of a large panel of data, and second, the identification of a limited number of structural shocks that explain the common components of the variables of interest. In a streamlined way, the estimation procedure requires the following:

- Use of a large panel of data fulfilling the condition that the number of time series is “much larger” than the number of observations (in a sense to be made clear below);
- Decomposition of each time series into two unobserved parts: a common component, driven by shocks common to all series, and an idiosyncratic component;
- Writing of the series’ common components as a VAR of low order (often of order one) to represent the reduced form of the model;
- Estimation of the VAR to obtain the coefficients matrix and the *reduced-form residuals*.
- Orthogonalization of these residuals to obtain the impulse-response functions and forecast error variances;
- Assuming that the orthogonalized residuals are linearly correlated to a vector of “fundamentals” driving the variable of interest via a matrix such that the first shock explains as much as possible of the forecast error variance of the common components; the second one explains as much as possible of the remaining variance, and so on;
- Computation of the impulse-response functions and the variance decomposition of the first few principal component shocks (e.g., the first two, neglect others);
- Recovery of the *structural shocks* that explain the principal component shocks by rotating a matrix such that orthogonal structural shocks produce impulse-responses satisfying a set of economically meaningful (sign) restrictions; and
- Construction of confidence intervals for the impulse-responses using bootstrapping so as to account for biases in the VAR coefficients and the agnostic nature of the model.

The estimation procedure is explained in detail below. The reader not interested in technical details can skip the remainder of this section.

The Model

7. **This paper uses a large dimensional approximate dynamic factor model.** As in Eickmeier (2005), this paper uses the static factor model of Stock and Watson (1998 and

2002). This model is closely related to the traditional factor models of Sargent and Sims (1977) and Geweke (1977), except that it admits the possibility of serial correlation and weak cross-sectional correlation of idiosyncratic components, as in Chamberlain (1983) and Chamberlain and Rothschild (1983). Similar models have recently been used by Giannone, Reichlin, and Sala (2002), Forni and others (2005), and Eickmeier (2005).

8. **The intuition behind the approximate dynamic factor model analysis is simple.** A vector of time series $Y_t = (y_{1t}, y_{2t}, \dots, y_{Nt})'$ can be represented as the sum of two latent components, a common component $X_t = (x_{1t}, x_{2t}, \dots, x_{Nt})'$ and an idiosyncratic component $\Xi_t = (\varepsilon_{1t}, \varepsilon_{2t}, \dots, \varepsilon_{Nt})'$

$$\begin{aligned} Y_t &= X_t + \Xi_t \\ Y_t &= CF_t + \Xi_t \end{aligned} \tag{1}$$

where $F_t = (f_{1t}, f_{2t}, \dots, f_{rt})'$ is a vector of r common factors and $C = (c'_1, c'_2, \dots, c'_N)'$ is a $N \times r$ matrix of factor loadings, with $r \ll N$. The common component X_t , which is a linear combination of common factors, is driven by a limited number of common shocks, which are the same for all variables. Nevertheless, the effects of the common shocks differ from one variable to another due to different factor loadings. In this framework and in contrast to standard common component analysis, the idiosyncratic component is driven by idiosyncratic shocks, which are specific to each variable. The static factor model used here differs from the dynamic factor model in that it treats lagged or dynamic factors F_t as additional static factors. Thus, common factors include both lagged and contemporaneous factors.

9. **Identification of the common components requires the number of series to be much larger than the number of observations.** Stock and Watson demonstrate that by using the law of large number (as $T, N \rightarrow \infty$), the idiosyncratic component, which is weakly correlated by construction, vanishes; and therefore, the common component can be easily estimated in a consistent manner by using standard principal component analysis. The first r eigenvalues and eigenvectors are calculated from the variance-covariance matrix $cov(Y_t)$.

$$X_t = VV'Y_t, \tag{2}$$

and since the factor loadings $C = V$, Equation (1) becomes,

$$F_t = V'Y_t. \tag{3}$$

From (1), the idiosyncratic component is

$$\Xi_t = Y_t - X_t. \quad (4)$$

From all the more or less formal criteria to determine the number of static factors r , Bai and Ng (2002) information criteria was selected. As in Forni and others (2005), F_t was approximated by an autoregressive representation of order 1²:

$$F_t = BF_{t-1} + u_t, \quad (5)$$

where B is a $r \times r$ matrix and u_t a $r \times t$ vector of residuals. Equation (5) is the reduced form model of (1).

Economic conditions for identification

10. **Once the process followed by the common components is postulated, structural shocks have to be identified.** The identification of structural shocks is achieved by focusing on the reduced form VAR residuals of (5). Following Eickmeier (2005), the identification scheme has three steps. First, as in Uhlig (2003), rather than identifying a shock as, say, a productivity shock, and calculate its contribution to the variance of the k -step ahead prediction error of, say, U.S. GDP, a few major shocks driving GDP are identified.³ This implies maximizing the explanation of the chosen variance of the k -step ahead forecast error of GDP with a reduced number of shocks.⁴ To this end, k -step ahead prediction errors u_t are decomposed into k mutually orthogonal innovations using the Cholesky decomposition. The lower triangular Cholesky matrix A is such that $u_t = Av_t$ and $E(v_t v_t') = I$. Hence, $\text{cov}(u_t) = AE(v_t v_t')A' = AA'$. (6)

11. **Next, impulse-response functions are calculated.** Following the example in which the variable of interest is U.S. GDP, the impulse-response function of y_{it} in period k to the identified shock is obtained as follows,

² VAR(1) provides a dynamic representation, which is parsimonious and quite general (for more details, see Gianonne, 2005).

³ Uhlig (2003) shows that two shocks are sufficient to explain 90 percent of the variance at all horizons of real U.S. GNP.

⁴ If, for example, two orthogonal shocks are identified, it is incorrect to identify the first shock as the one corresponding to the first eigenvalue and the second orthogonal shock as the one corresponding to the second eigenvalue (see Uhlig, 2003). The two orthogonal shocks identified generate *together* the total variation, the explanation of which is being maximized. However, there are multiple possible combinations of those orthogonal shocks all of which will still explain the total variation chosen: as an illustration, and measuring angles in degrees, the pairings of orthogonal shocks with rotation angles $\{0,90\}$ or $\{10,100\}$ or $\{80,170\}$ would be equally acceptable. The grid of the angle of rotation can be different, of course. Hence, the number of possibilities is vast. This paper uses a grid of 30 degrees.

$$R_{ik} = c_i B^k A \quad (7)$$

with c_i the i th row of factor loadings of C and with a corresponding variance-covariance matrix $\sum_{j=0}^k R_{ij} R'_{ij}$.

Second, suppose that an identified shock is linearly correlated to the fundamental forces $\omega_t = (\omega_{1t}, \omega_{2t}, \dots, \omega_{rt})'$ behind U.S. GDP, through the $r \times r$ matrix Q . Thus,

$$v_t = Q \omega_t. \quad (8)$$

12. The identification procedure involves maximizing the forecast error variance of the variable of interest. The intuition of the procedure is to select Q in such a way that the first shock explains as much as possible of the forecast error variance of the U.S. GDP *common component* over a certain horizon k , and the second shock explains as much as possible of the remaining forecast error variance. Focusing on the first shock, the task is to explain as much as possible of its error variance

$$\sigma^2(k) = \sum_{j=0}^k (R_{ij} q_1)(R_{ij} q_1)' \quad (9)$$

where i is, in our example, U.S. GDP, and q_1 is the first column of Q . The column q_1 is selected in such a way that $q_1' \sigma^2 q_1$ is maximized, that is

$$\begin{aligned} \sigma^2(k) &= \sum_{j=0}^k (R_{ij} q_1)(R_{ij} q_1)' \\ &= q_1' S_{ik} q_1 \end{aligned}$$

$$\text{where } S_{ik} = \sum_{j=0}^k (k+1-j) R'_{ij} R_{ij}.$$

The maximization problem subject to the side constraint $q_1' q_1 = 1$, can be written as the Lagrangean,

$$L = q_1' S_{ik} q_1 - \lambda (q_1' q_1 - 1) \quad (10)$$

where λ is the Lagrangean multiplier. From (10), q_l is the first eigenvector of S_{ik} with eigenvalue λ and, therefore, the shock associated with q_l is the first principal component shock. Q is the matrix of eigenvectors of S , (q_1, q_2, \dots, q_r) , where q_l ($l=1, \dots, r$) is the eigenvector corresponding to the l^{th} principal component shock. Along the lines of Uhlig (2003), Eickmeier (2005), and Altig and others (2002), it is posed: $k=0$ to $k=19$, i.e., five years, which covers short- as well as medium-run dynamics.

13. **Orthogonal shocks are finally identified by rotation.** If two shocks are identified, following Canova and de Nicoló (2003), the orthogonal shocks vector $\omega_t = (\omega_{1t}, \omega_{2t})'$ is multiplied by a 2×2 orthogonal rotation matrix P of the form:

$$P = \begin{pmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{pmatrix},$$

where θ is the rotation angle; $\theta \in (0, \pi)$ produces all possible rotations and varies on a grid. If θ is fixed and $q=5$, there are $q(q-1)/2$ bivariate rotations of different elements of the VAR. Following the insights of Sims (1998), and as in Peersman (2005), Canova and de Nicoló (2003), and Eickmeier (2005), the number of angles between 0 and π is assumed to be 12: this implies $6,191,736,421 \times 10^{10}$ (12^{10}) rotations. Hence, the rotated factor $w_t = P\omega_t$ explains in total all the variation measured by the first two eigenvalues. This way, the two principal components ω_i are associated with the two structural shocks w_i through the matrix P , and the impulse-response functions of the two structural shocks on all the fundamental forces can be estimated.

14. **A sign-identification strategy is followed to identify the shocks.** The method was developed by Peersman (2005). This strategy imposes inequality sign restrictions on the impulse response functions of variables based on a typical aggregate demand and aggregate supply framework.⁵ Only those rotations among all possible $q \times q$ rotations that have a structural meaning are chosen. The text table displays the sign restrictions for the identification of shocks that are imposed contemporaneously and during the first year after the shock.⁶

⁵ See Peersman (2005) for more technical details.

⁶ Note that inequalities include zero responses, some of which are usually excluded in the VAR literature. As shown by Peersman (2005), the latter may sometimes be unduly restrictive. Peersman shows, for example, that oil prices do react within one quarter to demand and monetary policy shocks. In contrast, imposing the standard contemporaneous zero restriction on oil prices make them appear as exogenous rather than as endogenous responses of an asset price to demand disturbances and monetary policy shocks.

Identification Inequalities

	Positive Supply Shock	Positive Demand Shocks	Monetary Policy Tightening
GDP	≥ 0	≥ 0	≤ 0
Prices	≤ 0	≥ 0	≤ 0
Interest rate	≤ 0	≥ 0	≥ 0

C. Data and Estimation

Data

15. **This paper uses a large data panel.** It comprises 482 quarterly series ($N = 482$) covering the period 1980:Q1–2003:Q4. This implies 96 observations ($T = 96$). The countries included in the sample are France, Germany, Italy, Japan, Spain, the United Kingdom, and the United States. In addition to national variables, a set of global variables is included, containing such items as crude oil prices and a commodity industrial inputs price index. The variables cover the real sector of the economy including consumption, investment, international trade in goods and services, portfolio flows and FDI flows, prices, financial variables, and confidence indicators.

16. **For comparison purposes, a shorter time period is also estimated.** The data panel for the shorter time period includes the same macroeconomic time series plus a G7 (excluding France) and a euro area (excluding France) real GDP series and two corresponding price series ($N = 486$). This data set covers the period 1991:Q1–2003:Q4, or 51 observations ($T = 51$). The complete list of variables used in this study is in Appendix I.

17. **Variables were transformed, if necessary, to make them covariance stationary.** All the variables are seasonally adjusted. The unit root test developed by Elliot, Rothenberg, and Stock (1996) was applied to all series to decide on the statistical transformation necessary to make them stationary, if needed. The unit root tests included a constant and a deterministic trend. The number of lags was chosen using the Schwarz information criterion and taking care that no serial correlation was left in the residuals. In a few cases, unit root test results were unclear. In those cases, the unit root test with the null hypothesis of stationarity proposed by Kwiatkowski, Phillips, Schmidt, and Shin (1992) was used. The statistical treatment of the series is summarized in Appendix I. All series were standardized to have zero mean and unit variance.

Estimation

18. **The first step of the estimation is the determination of the number of factors.** The estimation was done assuming that the series follow an *approximate* dynamic factor

model.⁷ As discussed in Section B, the first step is to decide on the number of static factors r making up the common component. Using Bai's and Ng's (2002) selection criteria, five factors were retained. Not much can be concluded from the inspection of the factors and their loadings, however, because factors are identified only up to a rotation. Moreover, factors can be a linear combination not only of their contemporaneous values, but also of their lags.

19. **Next, the identification of the structural shocks followed the approach of the structural VAR literature.** No identification technology is completely foolproof, however. While the identification technology followed in this paper is flexible enough not to require special restrictions to disentangle *common shocks* from the *contemporaneous transmission of regional or country-specific shocks*, it does require additional work, for example, to confirm the source of shocks (e.g., that the shocks originate in the U.S. economy). In order to properly distinguish a global (common) shock from the transmission within the same period of a country- or regional-specific shock, following Eickmeier (2005), this paper does not restrict the impact effect of the shock. Moreover, after identifying two U.S. shocks and giving them an economic interpretation, this study performs the same analysis on a data set containing *only* U.S. variables. It finds that the impulse-responses of the U.S.-only data set and the broader data set are similar, bringing thus further comfort as to the identification of the source of the shocks. In addition, to test the relative importance of U.S. shocks as sources of disturbances that impact French activity, the same identification restrictions are imposed on a G7 aggregate of economic activity (excluding France). Finally, the same approach is applied to a euro area aggregate of economic activity (excluding France) to probe the data for what could be a source of “regional” shocks.

20. **Only two structural shocks could be identified.** As explained in Section B, the identification procedure proposed by Uhlig (2003) was applied to the common components of U.S. GDP to find a reduced number of structural shocks, which maximizes the explanation of its forecast error variance over 20 periods. The procedure was designed to identify three shocks, but could extract two shocks, which suffice to explain 98 percent of the forecast error variance of the common component of U.S. real GDP.

21. **Sign restrictions on impulse response functions were used to give economic meaning to the structural shocks.** Following Peersman (2005), and as in GEM (2004) and other major standard macroeconomic models, a positive supply shock has a nonnegative effect on output and a nonpositive effect on prices during the first four quarters following the shock.⁸ A positive demand shock has a nonnegative effect on both output and prices during the first four quarters following the shock. A monetary policy tightening has a nonpositive effect on both output and prices during the first four quarters following the shock. The angle rotations were applied to the first two principal component shocks taking as pairs a supply

⁷ We are deeply grateful to Sandra Eickmeier for having provided us with the main code for the estimation and for her technical support and insights.

⁸ Clearly, a set of restrictions based on neoclassical model features would produce different results. Interestingly, it can be shown that there is no “price puzzle” à la Sims (1992) in a Neokeynesian model with rational expectations (Nadal De Simone, 2001).

shock together with a monetary policy shock, a demand shock together with a monetary policy shock, and a supply and a demand shock together. The bootstrap was made up of 500 draws. In the case of the U.S. shocks, only the pair of demand and supply shocks could be identified; no pair containing a monetary policy shock could be identified.⁹ The same results were obtained when identifying G7 and euro area shocks.¹⁰ The impulse-response functions were calculated for the first five years to display the cyclical pattern associated with the structural shocks. Both the median response and a 90 percent bootstrapped confidence band were estimated.

D. Econometric Results

U.S. shocks

22. **In the tradition of the structural VAR literature, results are presented in the form of variance decomposition and impulse-response functions.** Table 1 shows the variance decomposition and the forecast error variance of the common components (henceforth, error variance) of U.S. and French variables explained by the two identified U.S. shocks.¹¹ For comparison purposes, Table 2 displays the error variance of German variables explained by the U.S. shocks. Figure 1 shows the impulse-response functions of the U.S. shocks and their impact on U.S. and French variables.

23. **The supply and demand shocks account for 98 percent of the error variance of U.S. GDP common components.** When the full sample period, i.e., $N = 482$ series and $T = 95$ observations is used, the supply and demand shocks from the United States account for 87 percent and 11 percent of the error variance of U.S. GDP over 20 quarters, respectively. Given that the variance share of U.S. GDP common components is 54 percent, the supply shock explains about 47 percent (i.e., 54 percent x 87 percent) and the demand shock 6 percent (i.e., 54 percent x 11 percent) of the error variance of U.S. GDP, respectively.

24. **The U.S. supply shocks are relatively more important than demand shocks.** The relatively larger importance of supply shocks is consistent with the literature on real business cycles that stresses these shocks (i.e., productivity-driven shocks) as the most significant source of U.S. business cycles. Consistently, supply shocks are far more persistent than

⁹ Before one can draw the conclusion that monetary policy contributes little to business cycle fluctuations, it would be advisable to work with a more elaborate sign restriction for monetary policy. This is clearly beyond the scope of this paper.

¹⁰ The identification of the U.S. shocks required 524 draws, while 639 and 502 draws were necessary for the identification of the G7 and the euro area economic activity shocks, respectively.

¹¹ A measure of the explanatory power of each variable can be obtained by weighing the median forecast error variance of the common components explained by the shock by the variance share of the common components of the variable. To help the reader, for each variable, the last column of each table displays the percentage of the forecast error variance of the common components explained by the sum of the two shocks.

demand shocks. The results are broadly in agreement with those of Eickmeier (2005).¹² Positive demand shocks result in increased investment and consumption, with the rise in the latter relatively less persistent (Figure 1). Following a mild initial increase, productivity declines after a few quarters as the strong effect of the shock on employment is relatively protracted. Given that the measure of capacity utilization used includes new hiring and that investment, consumption, and government net savings increase, demand shocks may be capturing investment-driven cycles (less likely, consumption-driven ones). In the same vein, interest rates rise, especially short-term interest rates, as monetary policy may be trying to offset the effects of the economic expansion on prices as reflected in the CPI. Consistently, the money stock (M1) falls. Finally, and in contrast to supply shocks, demand shocks have virtually no effects on stock prices after 6–8 quarters.

25. **Evidence supports the U.S. origin of the shocks.** First, it is noteworthy to stress that the identification strategy followed in this study, by construction, extracts supply and demand shocks that maximize the explained forecast error variance of the common components of U.S. real GDP. Second, indirect and direct evidence suggesting that the source of the identified shocks is the United States is the following. Indirect evidence comes from, as in Eickmeier (2005), a dataset containing only U.S. variables. The resulting impulse-response functions were similar to those of the full sample (not shown). In addition, given the relatively low values of the common components' share of some global variables (i.e., crude oil prices, 26 percent, commodity metal prices, 19 percent, and a commodity industrial input index, 33 percent), it seems unlikely that the identified shocks are global (common) as opposed to U.S.-specific.¹³ Finally, further indirect support for the result that the shocks originate in the United States can be gathered, as discussed below, from the observation that most effects of the U.S. shocks on French variables error variance are significantly smaller than on U.S. variables; given the relatively lower size and larger openness of the French economy, those features of the results are more consistent with a U.S. source than with a global source of the shocks. The direct evidence on the U.S. source of the shocks comes from the estimation of the cross-spectrum of the common components of U.S. and France's GDP (Figure 2, left side panels). The phase angle is clearly positive in periodicities between two and eight years, the business cycle band, indicating that U.S. GDP common components lead French GDP common components at that frequency band.

Channels of transmission of U.S. shocks to France

26. **Broadly speaking, U.S. supply shocks are transmitted to France less forcefully than U.S. demand shocks.** The variance share of French variables suggest that foreign trade and relative prices—i.e., terms of trade and/or the real effective exchange rate—and FDI

¹² The impulse-response functions of short- and long-term interest rates are particularly sensitive to the procedure applied to make the series stationary; this is a problem likely related to the difficulty encountered by unit root tests in providing conclusive evidence on the order of integration of the variables. Results displayed in the paper use differenced interest rate series. The short-term interest rate behavior is difficult to explain as it falls only marginally following the shock and during a very short period of time.

¹³ Crude oil prices are a simple average of dated Brent, West Texas Intermediate, and Dubai Fateh oil prices.

flows matter for the transmission of both U.S. shocks to France. However, while U.S. supply shocks explain 3 percent and 12 percent of the error variance of French exports and imports, respectively, demand shocks explain about 90 percent and 45 percent of the respective common components. Stock prices and consumer confidence matter most for the transmission of U.S. supply shocks while interest rates matter most for the transmission of U.S. demand shocks: supply shocks explain over 55 percent of the error variance of the French variables and over 50 percent of consumer confidence; demand shocks explain about 80 percent of the error variance of French interest rates.¹⁴ In addition, while U.S. supply shocks have a lasting effect on U.S. and French stock markets, demand shocks' effects are temporary and relatively small.

27. U.S. supply shocks may seem to be transmitted negatively on French output.

While French output is affected negatively by U.S. supply shocks with a median error variance (over the first five years) of 23 percent, the outcome is in fact statistically insignificant.¹⁵ Stock prices are affected positively and in lasting manner. In addition, notice the negative effect on employment and wages and, consistently, the negative effect on consumer confidence. The current account records a surplus as, over time, exports of goods and services increase more than imports. The terms of trade improve somewhat, and the real effective exchange rate appreciates marginally. There is no lasting significant change in the real effective exchange, however. The downward impact effect on interest rates (especially short-term interest rates), possibly as a result of an accommodating action on the part of Euro area monetary policy makers, is relatively short-lived. Outward FDI flows are relatively more important than inward FDI flows for supply shocks; that the outward FDI flows decrease at the end of the five-year period is difficult to explain.¹⁶ The bottom line is that France seems to adjust to the U.S. supply shock.

28. U.S. demand shocks get transmitted positively to France. Over the sample period 1980–2003, U.S. demand shocks of about 1 percent of GDP (over 20 quarters) have a significant positive impact on France's real GDP of 0.5 percent. Consumption and investment rise in response. Demand drives up French productivity, with benign effects on

¹⁴ These results are consistent with IMF (2001) and other studies (e.g., Anderton, di Mauro, and Moneta, 2004) which stress the role of financial variables and confidence channels in the transmission of macroeconomic disturbances across countries. While in the words of Keynes, "The state of confidence...is a matter to which practical men always pay the closest and most anxious attention", economists have mostly avoided the issue. The profession has accepted that mood swings are difficult to explain. This paper uses generally accepted measures of confidence as "channels" through which views of the world unfold and affect, for instance, business investment decisions by mechanisms not yet identified.

¹⁵ This outcome is consistent with Eickmeier's (2004) results on the effects of the U.S. supply shock on German GDP; she finds a positive effect, which is nevertheless not statistically significant. The sign of shocks transmission is controversial in the empirical literature: those who stress traditional trade channels of transmission posit that a supply shock, by boosting trading partners exports, is transmitted positively (e.g., Kose, Prasad, and Terrones, 2003). In contrast, those who stress inter-industrial specialization and FDI flows hypothesize a negative transmission (e.g., Imbs, 2004).

¹⁶ The variance share of these variables is low, anyway. Eickmeier (2004) reports similar results.

the price level. Exports rise more than imports in the first 4–6 quarters producing a small current account surplus, which turns into a deficit as imports remain high while the impulse on export fades. The terms of trade worsen, most likely due to the effect of the positive U.S. shock on global price variables such as oil and metal prices. The real effective exchange rate depreciates somewhat, especially during the first year. There is a lasting, albeit small, effect on both consumer and business confidence. Both short- and long-term interest rates increase most likely as a result of Euro area monetary policy trying to avoid that employment and wage growth translate into inflationary pressures.

29. U.S. shocks affect different EU member countries asymmetrically.¹⁷

A comparison of the error variance of French and German variables reveals a few noteworthy points. Most importantly, U.S. shocks affect French output more than German output. The weighted effect of the U.S. supply shocks on output is 10 percent in France and less than 1 percent in Germany. The U.S. demand shocks effect on output is 14 percent in France and 5 percent in Germany. In addition, while consumer confidence matters more for France than for Germany, the trade channel, the terms of trade, and the real effective exchange rate are relatively more relevant channels for Germany than for France, presumably due to the larger share of foreign trade in German GDP.¹⁸

Is there evidence of increasing interdependence among countries?

30. France's interdependence has increased over time. The estimation of the model using the time period 1990:Q1–2003:Q4 shows that, as might be expected, France experienced a strengthening of its linkages and interdependence with the rest of the world during the last decade or so. While the total weighted error variance of French GDP explained by U.S. shocks in the full sample period is about $\frac{1}{4}$, it increases to well over $\frac{1}{2}$ when the recent sample period is used (Table 3).¹⁹ This increase basically took place through a significant rise in the role of U.S. demand shocks. Besides the enhanced role of the stock market channel in more recent times, the business confidence channel also increased its significance.²⁰ Consistently, the impact of investment in explaining activity fluctuations in

¹⁷ The presence of asymmetries in business cycle behavior across countries is well known (e.g., Nadal De Simone, forthcoming).

¹⁸ As stated above, and given the differences in the total forecast error variance of French and German GDP explained by U.S. shocks, it is important to relate the share of each channel forecast error variance to the share of each country's forecast error variance explained by U.S. shocks. For example, while on Table 1b, French exports total error variance is larger than German exports total error variance shown on Table 2, the opposite is true when those shares are weighted by the respective shares of U.S. shocks in the total error variance of French and German GDP.

¹⁹ It also increases in the German case: it rises to about 40 percent from 28 percent in the full sample. This is most likely the result of the significant output effects of German reunification, which clearly blurred the underlying forces of economic integration of the German economy into the world.

²⁰ These results are consistent with IMF (2001) that reports a growing importance of financial variables in the transmission of shocks across countries over time.

France also rose. It also seems that France's capacity to adjust to U.S. demand shocks became more difficult during the last decade: note, in particular, the relatively lower variance of employment, wages and prices that U.S.-driven demand shocks explain in the recent sample.

31. **Adjustment to U.S. shocks varies across countries.** When France is compared with Germany, a few points stand out. While the error variance of French variables is lower than that of German variables following U.S. supply shocks, it is very similar following U.S. demand shocks (i.e., compare wages error variances in Table 3a for France and Table 3b for Germany with the respective error variances of GDP).²¹ Consistently, employment does relatively more of the adjustment to U.S. supply shocks in France than in Germany. French prices have lower variance than German prices following U.S. supply shocks, and the real effective exchange rate variance explained by the U.S. shocks is, therefore, much larger in France.

32. **Recent history further confirms the predominant role played by U.S. shocks.** With data available for 1991:Q1–2003:Q4 for broader aggregates of global and regional economic activity, the paramount role of U.S. shocks seems confirmed. When the shock is to G7 economic activity (excluding France), the error variance of French GDP explained increases to 59 percent (7 percentage points more than when shocks are from the United States, in the period 1980–2003). These results further stress the large role played by U.S. shocks in international business cycles.

33. **There is limited evidence of “regional shocks.”** When the shock is to the euro area activity measure (excluding France), the error variance of French GDP explained rises from 52 percent to 63 percent (Table 4). In addition, the cross-spectrum of EU and French GDP common components is very similar to the one of U.S. and French GDP common components (Figure 2), with, however, one caveat. EU GDP common components lead France's common components in the very long run, i.e., in periodicities beyond eight years, where there is no significant comovement between the United States and France. Finally, the cross-spectrum of U.S. and EU GDP common components clearly shows that United States leads the EU (Figure 3). The results suggest that there may be some role for “regional factors” in explaining the error variance of French GDP, but that role can be tentatively considered small. This finding is broadly consistent with several studies suggesting a relatively minor role to regional factors (e.g., Kose, Otrok, and Whiteman, 2003, and Nadal De Simone, 2003).

34. **Asymmetries in business cycle transmission persist during the shorter sample period.** G7 economic activity affect French output relatively more via demand shocks, while euro area activity affects French output relatively more via supply shocks. This is most likely the outcome of the relatively richer vertical and horizontal integration between French and regional firms than between French and other non-euro area G7 countries' firms. As an

²¹ Compared to wages behavior in the full sample, French wages variance following U.S. supply shocks did not change, but it halved following U.S. demand shocks.

illustration, the supply shocks from the euro area aggregate explain a significantly larger share of the error variance of exports of goods and services than the G7 shocks or the U.S. shocks. Similarly, the large increase in the explained error variance of French confidence variables (especially business confidence) when the shock is to euro area activity, further indicates the likely presence of a regional factor which, albeit seemingly small, deserves further analysis.

E. Conclusion and Policy Implications

35. **French output behavior is significantly affected by U.S. shocks.** This study found that U.S. shocks, especially demand shocks, play an important role in explaining the behavior of French economic activity. International trade in goods and services, the terms of trade, the real effective exchange rate, and FDI flows are the main channels of transmission of U.S. demand and supply shocks. Financial variables, such as interest rates, are also important. The stock market and consumer confidence channels seem relatively more relevant for the transmission of U.S. supply shocks, with interest rates instead being relatively more important for the transmission of demand shocks. There still remains a significant role for regional and country-specific components to contribute to the explanation of French output fluctuations, but relatively less than in the German case, especially when the period considered excludes the 1980s.

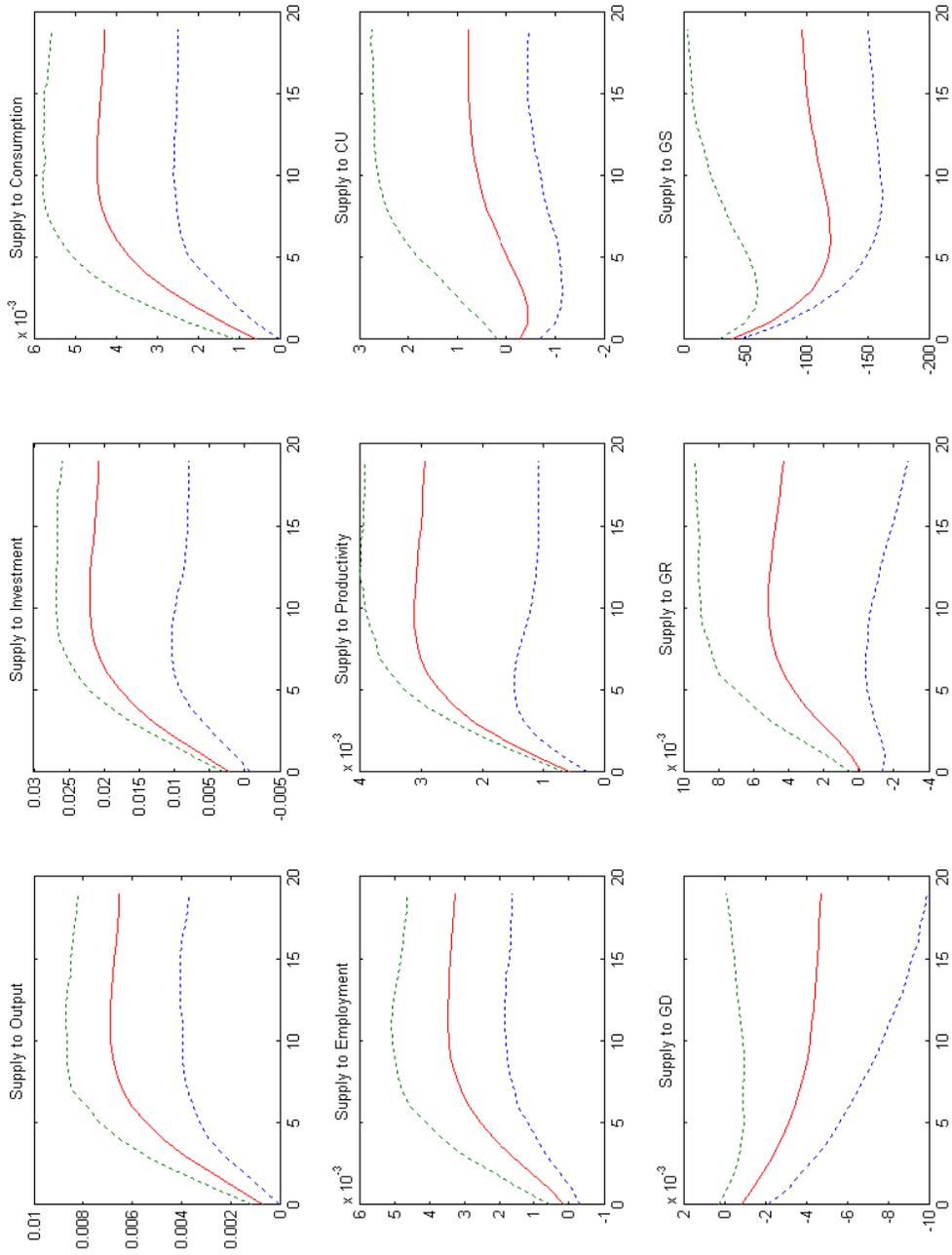
36. **France has become more integrated into the global economy.** The interdependence of the French economy has increased over time, and the role of financial variables as channels of transmission of shocks has become relatively more important. The increased importance of the business confidence channel is also noteworthy. In addition, and compared to Germany, the French economy reacts to foreign shocks relying relatively more on employment and productivity changes than on changes in wages.

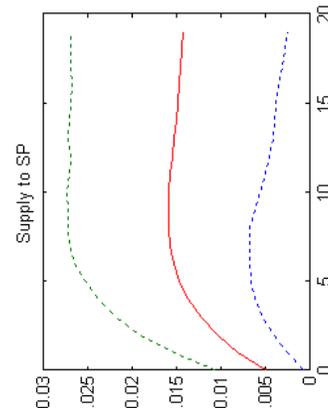
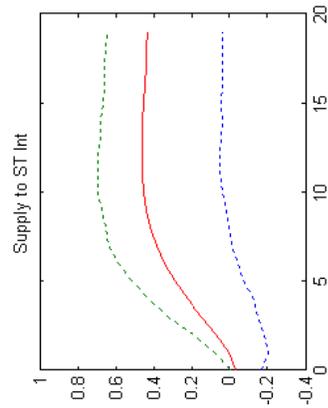
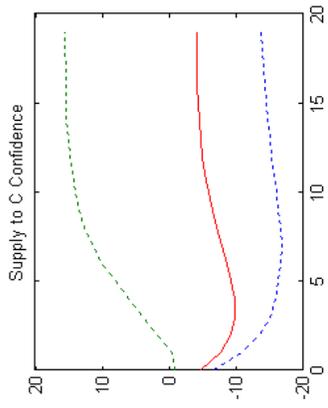
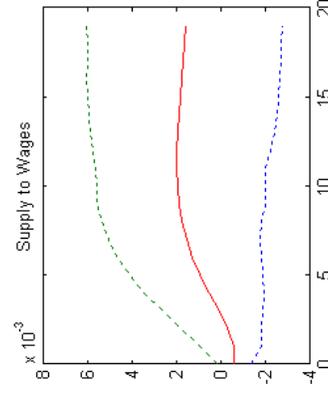
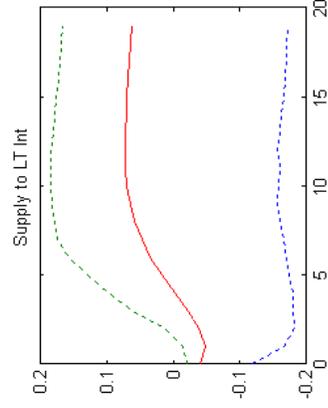
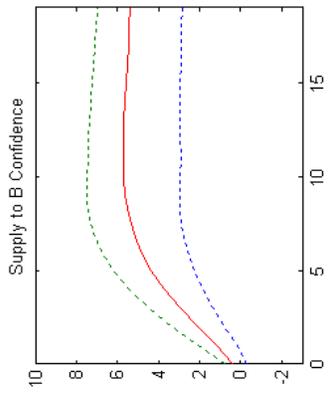
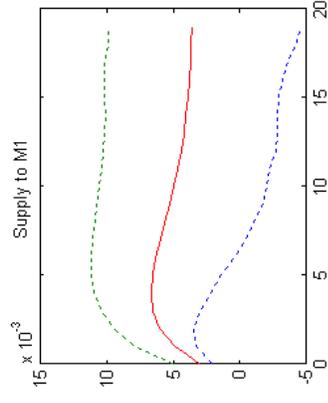
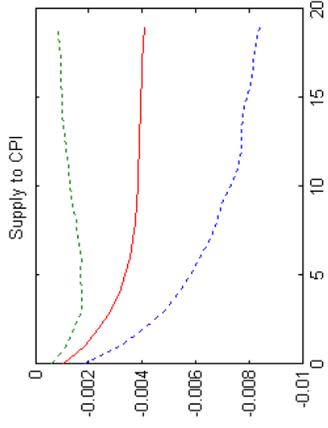
37. **U.S. shocks explain a large part of French output common components.** While the use of a broader aggregate of economic activity than just U.S. real GDP adds to the explanation of French economic activity fluctuations, the bulk of its variance can already be captured by a pair of distinctively U.S. shocks. This seems especially so for the post-1990 period. The results stress the important role played by fluctuations in U.S. economic activity in explaining French economic fluctuations.

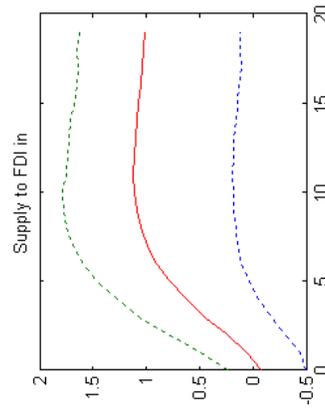
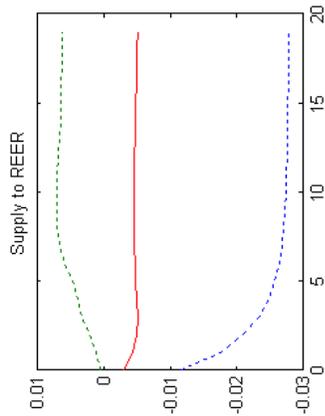
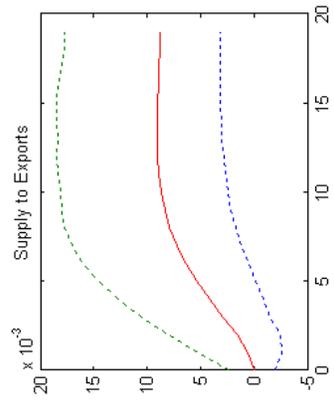
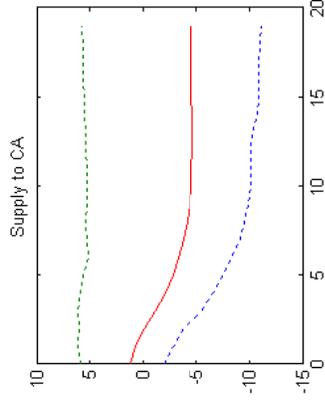
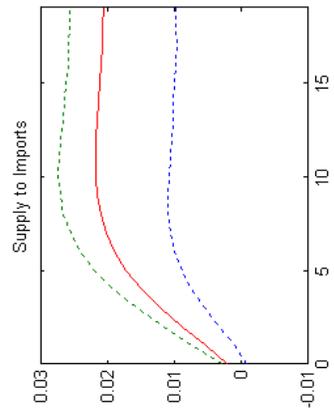
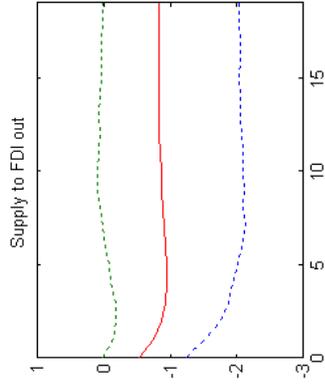
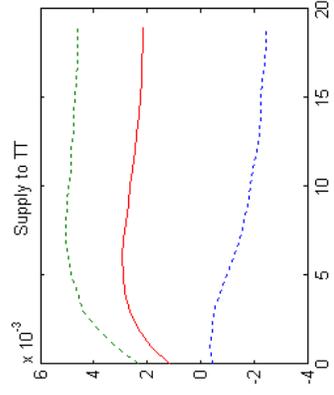
38. **The French economy would benefit from further structural reforms increasing its flexibility.** The importance of trade flows and relative price changes in the international transmission of disturbances highlights the relevance of domestic price flexibility. As the results of the paper suggest, following U.S. supply shocks, the speed of adjustment of French prices relative to U.S. prices is slower. This will matter for the magnitude of the real effective exchange rate changes, trade flows, and the size of the current account balance that will be necessary to accommodate the given disturbance. Similarly, following shocks in the United States, it is likely that, *ceteris paribus*, the level of interest rates consistent with price stability in France will be higher the more rapidly the shock is transmitted into wages. These conclusions are hardly unexpected, but the framework used in this paper has evinced, in a robust way, their policy relevance.

39. **The asymmetry in the transmission of U.S. shocks to different euro area members further supports calls to increase markets flexibility.** This asymmetry—illustrated here by comparing French and German variables responses to U.S. shocks— together with the predominant role that exogenous factors play in the dynamics of French output, argue for domestic policies geared toward boosting goods, services, and labor markets flexibility in France.

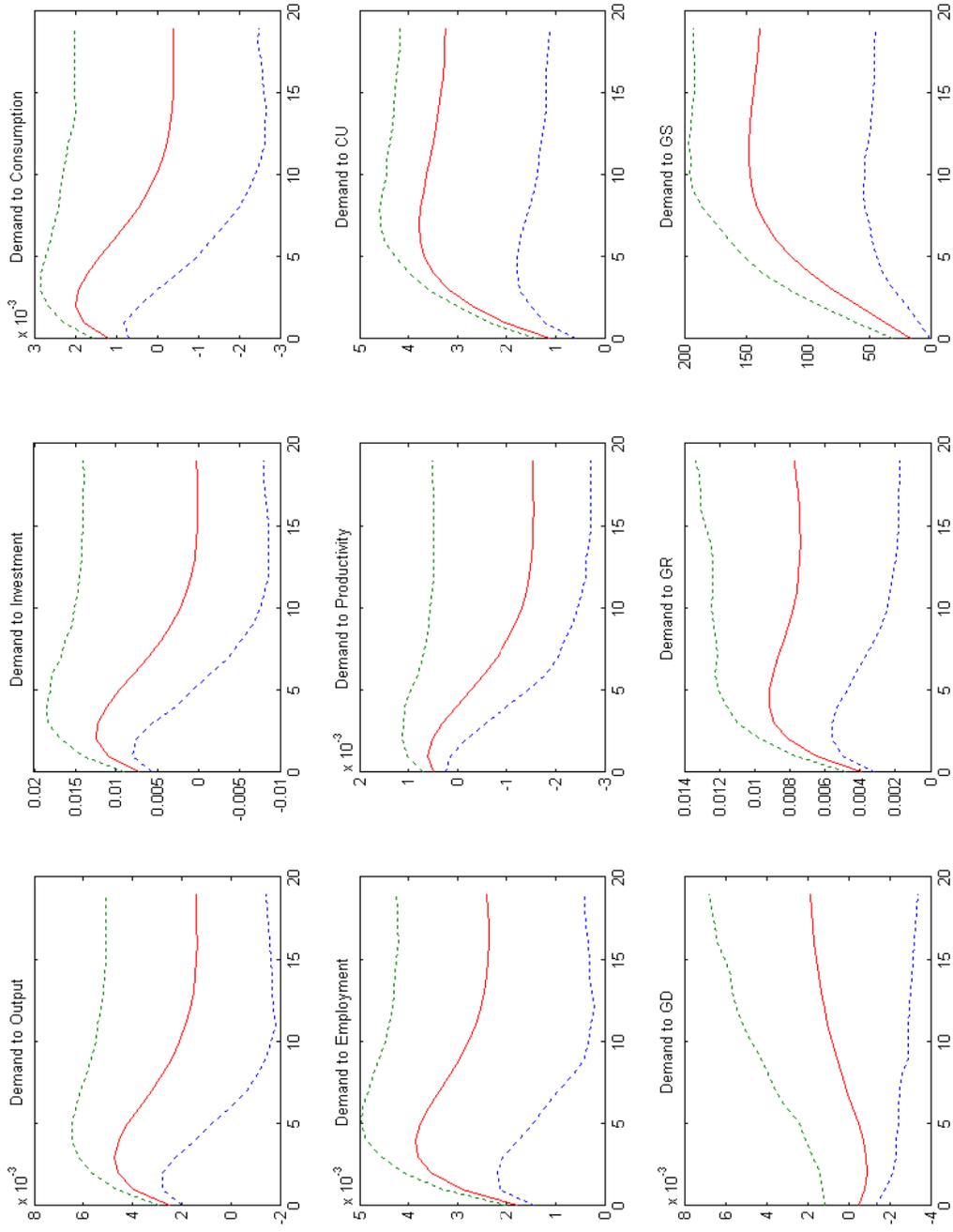
Figure 1. Impulse-Response Functions
 Full sample—1980:Q1–2003:Q4 (482 series)
 Supply Shock (USA)

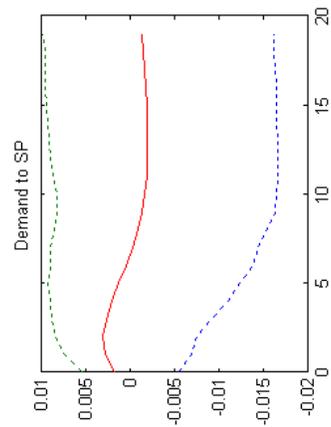
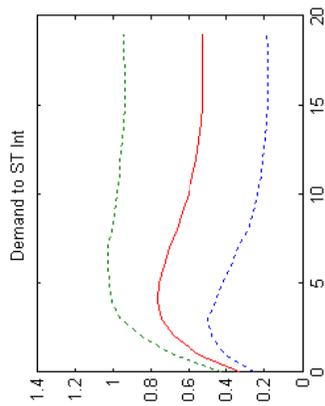
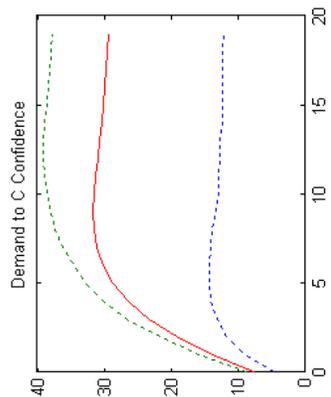
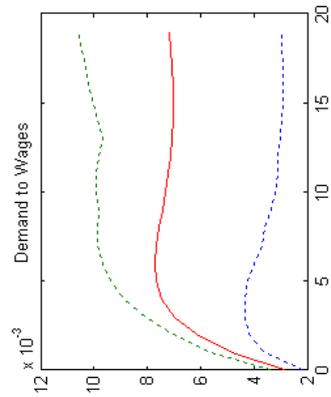
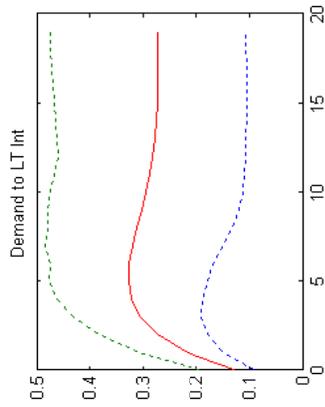
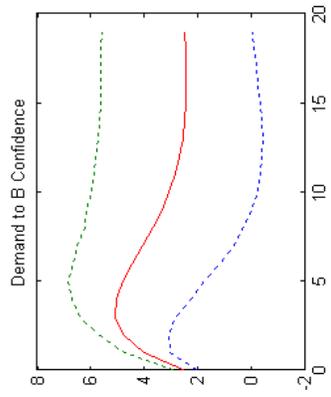
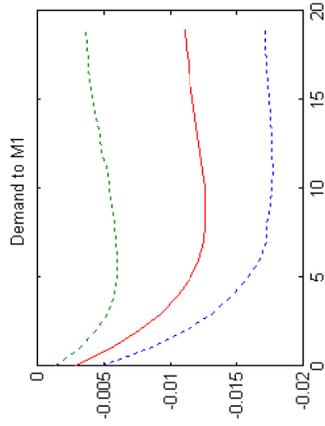
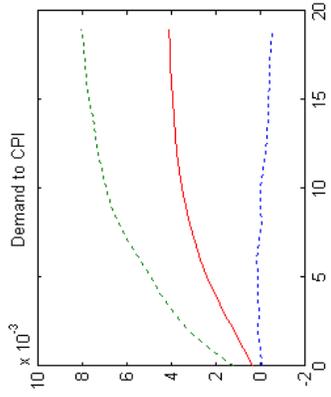


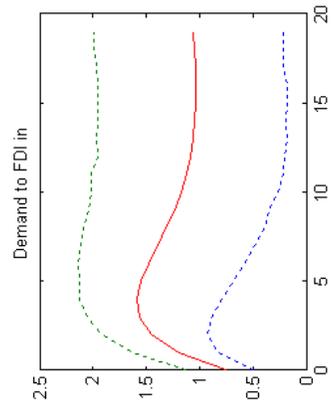
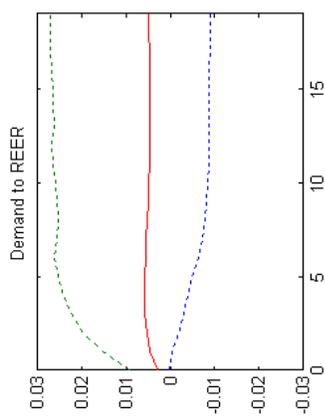
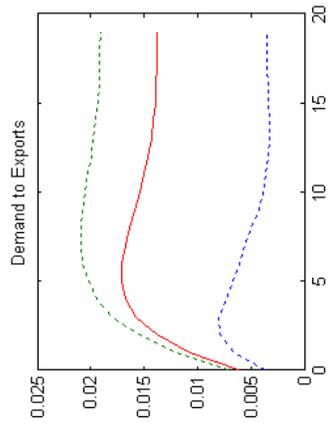
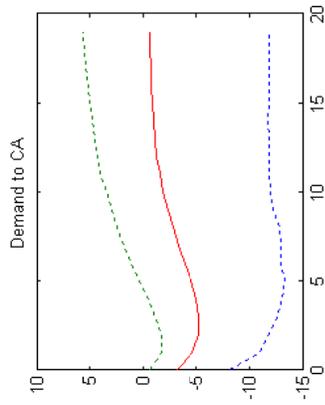
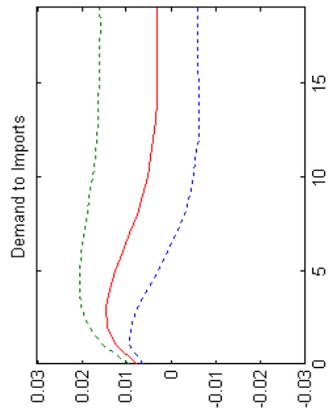
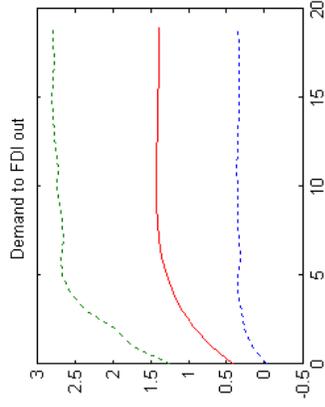
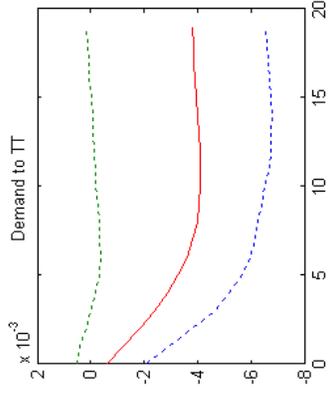




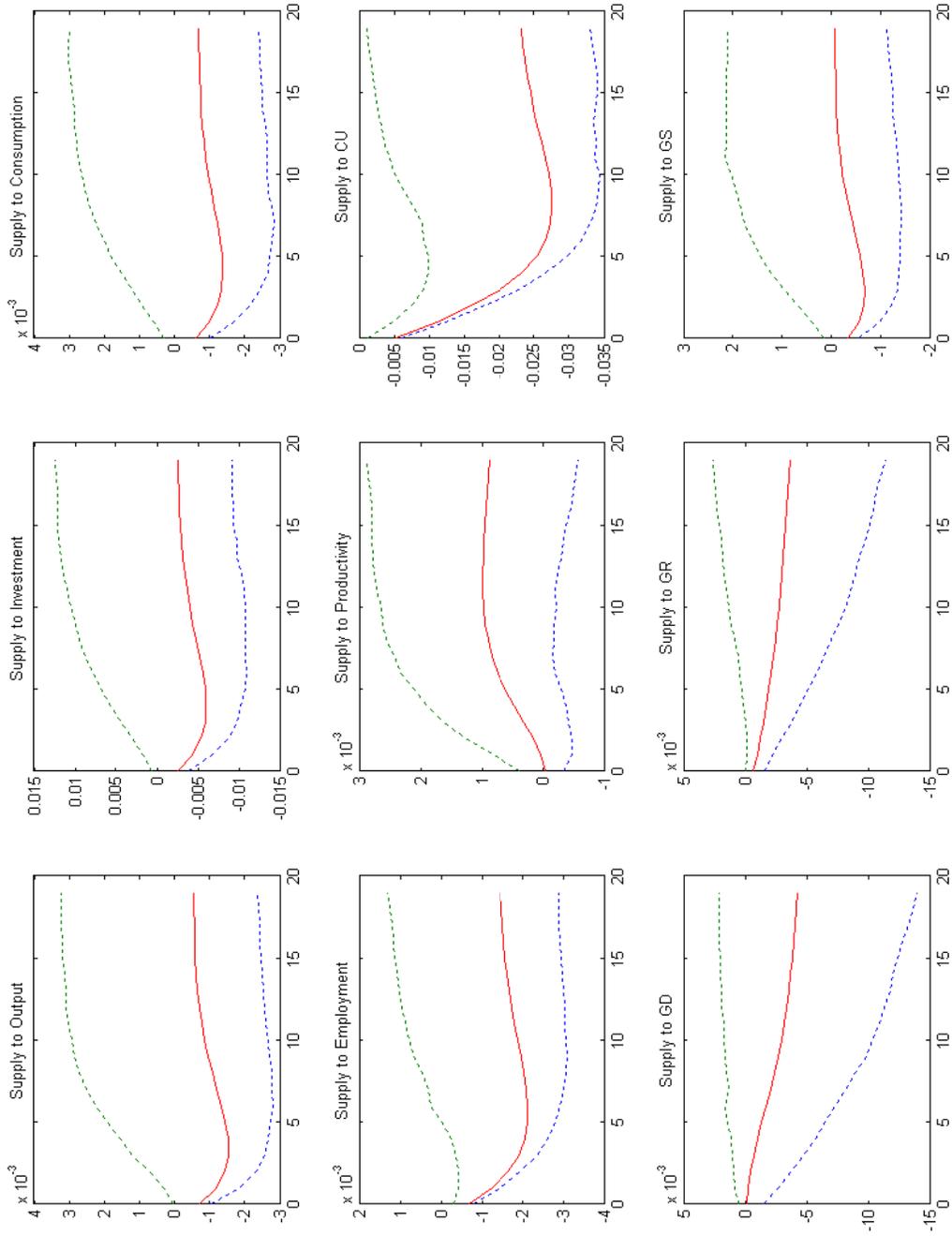
Demand Shock (USA)

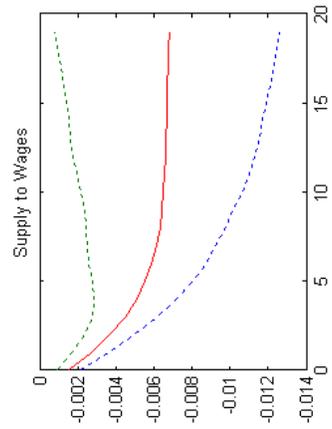
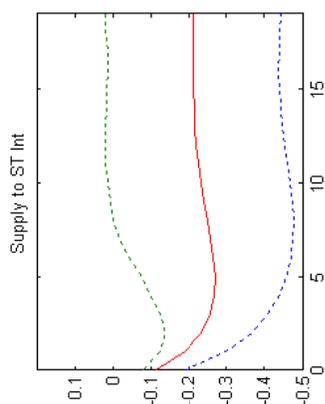
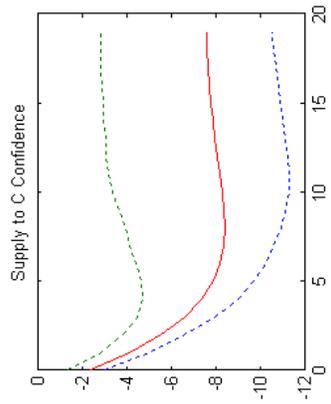
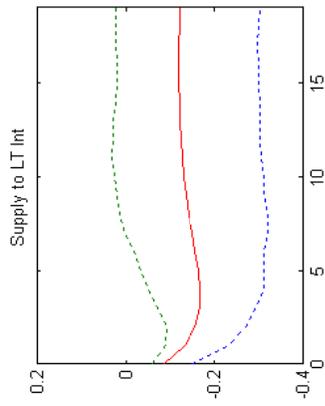
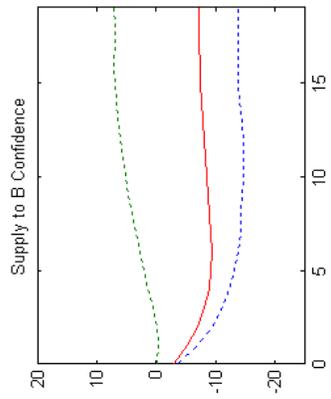
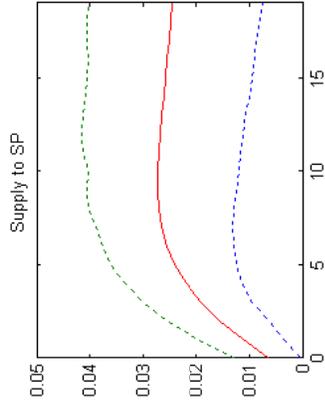
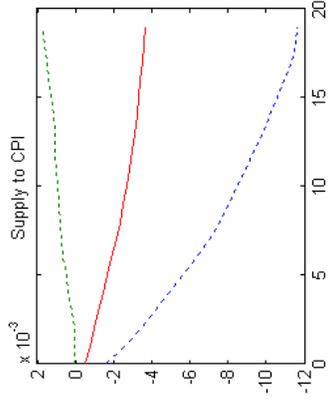


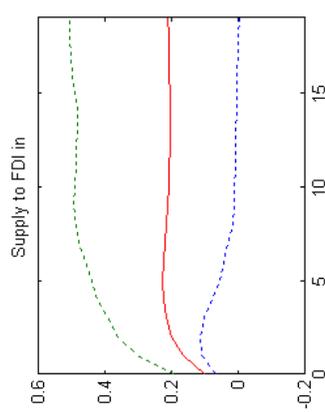
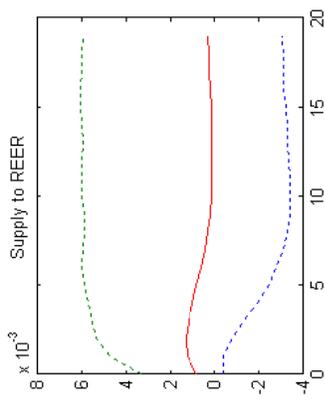
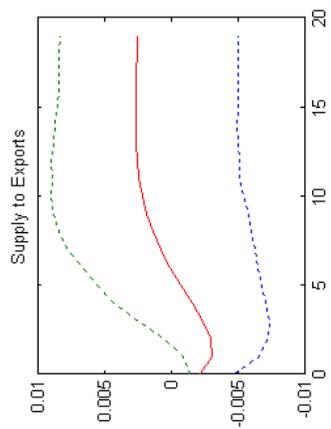
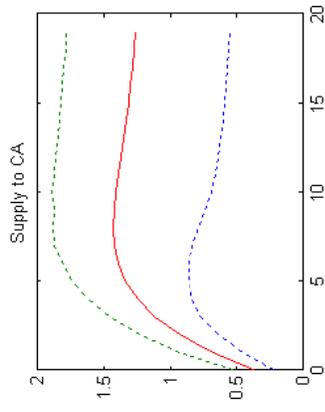
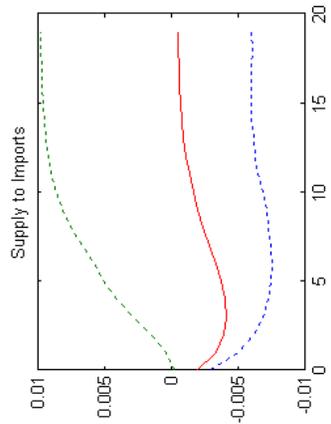
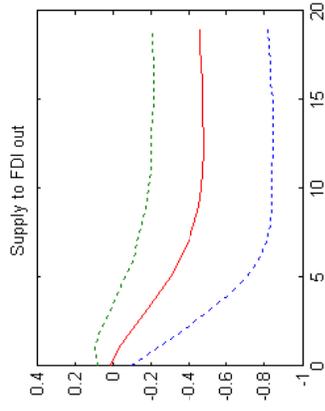
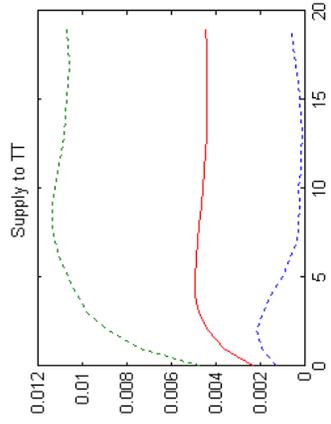




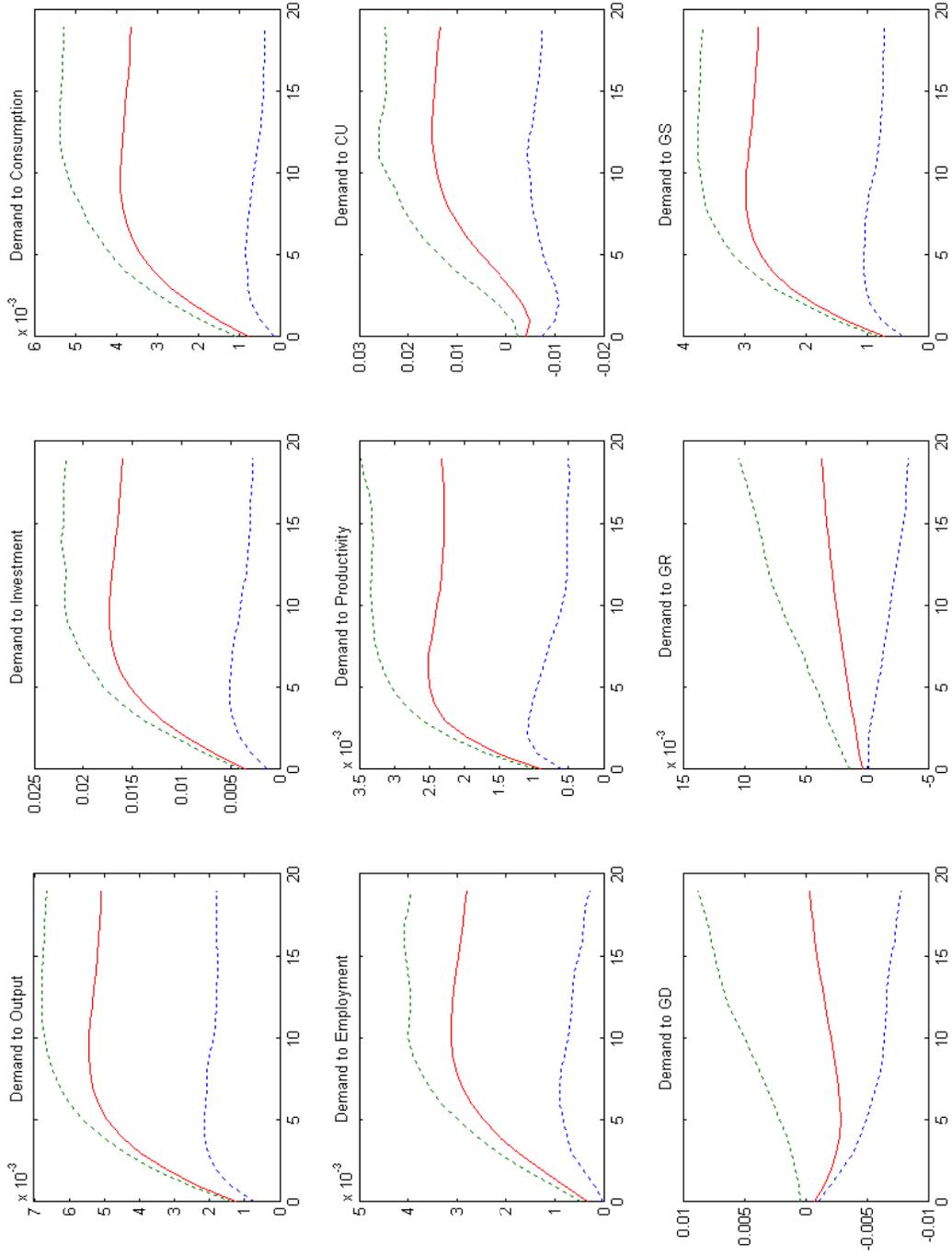
Supply Shock (France)

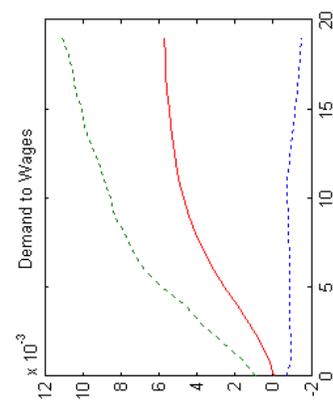
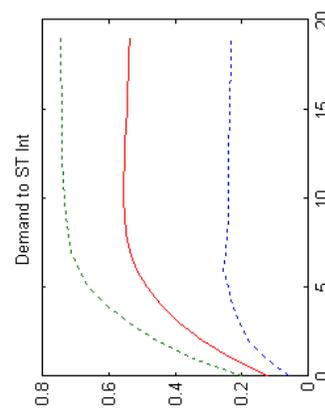
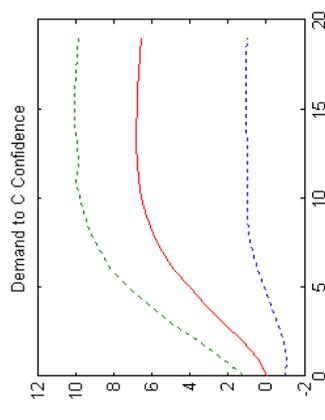
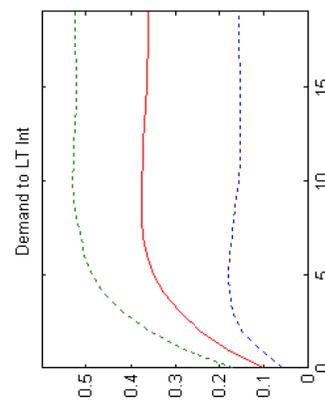
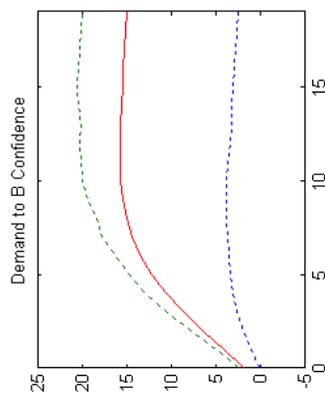
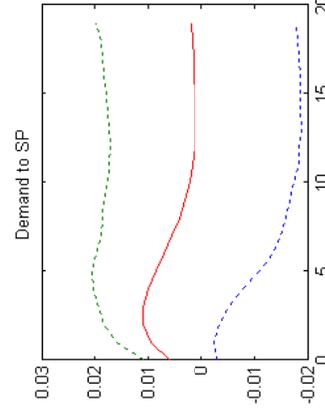
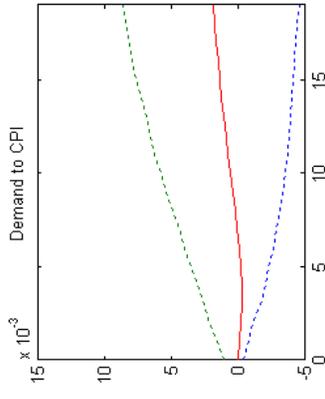


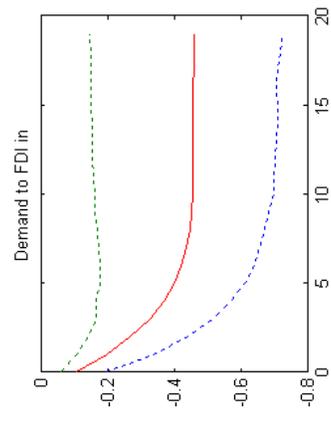
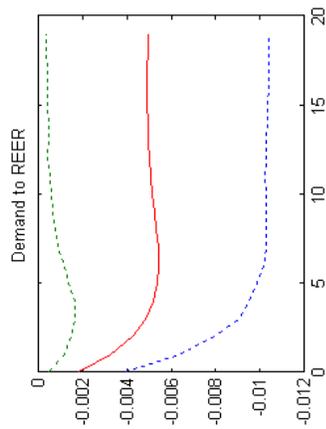
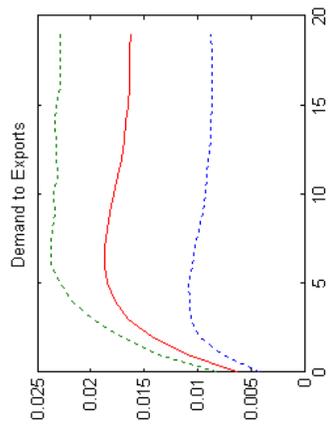
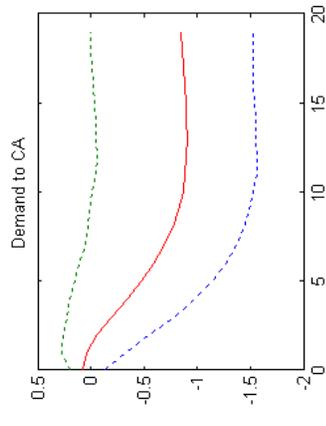
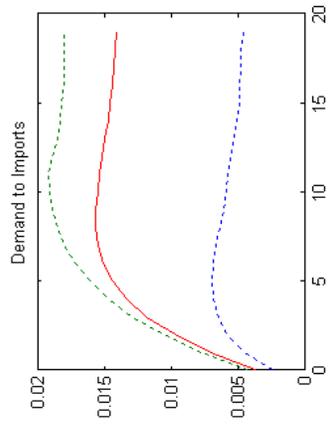
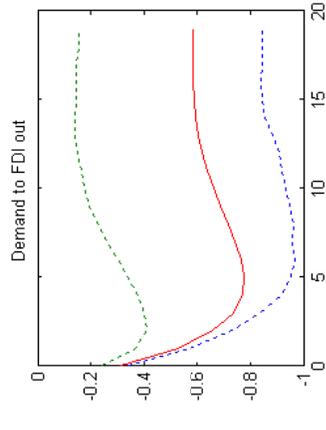
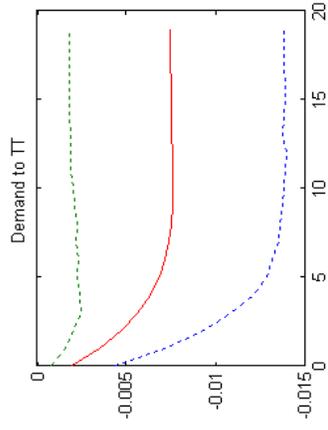




Demand Shock (France)







Acronyms

CU	Capacity utilization
GD	Government current disbursements
GR	Government current receipts
GS	Government net savings
C Confidence	Consumer confidence
B Confidence	Business confidence
CPI	Consumer price index
ST Int	Short-term interest rate
LT Int	Long-term interest rate on government bonds
SP	Share price index
TT	Terms of trade
REER	Real effective exchange rate
CA	Current account of the balance of payments
FDI	Foreign direct investment flows

Figure 2. Common Components: Q2 1991 - Q4 2003
 Shocks: USA GDP and EU (excluding France) GDP

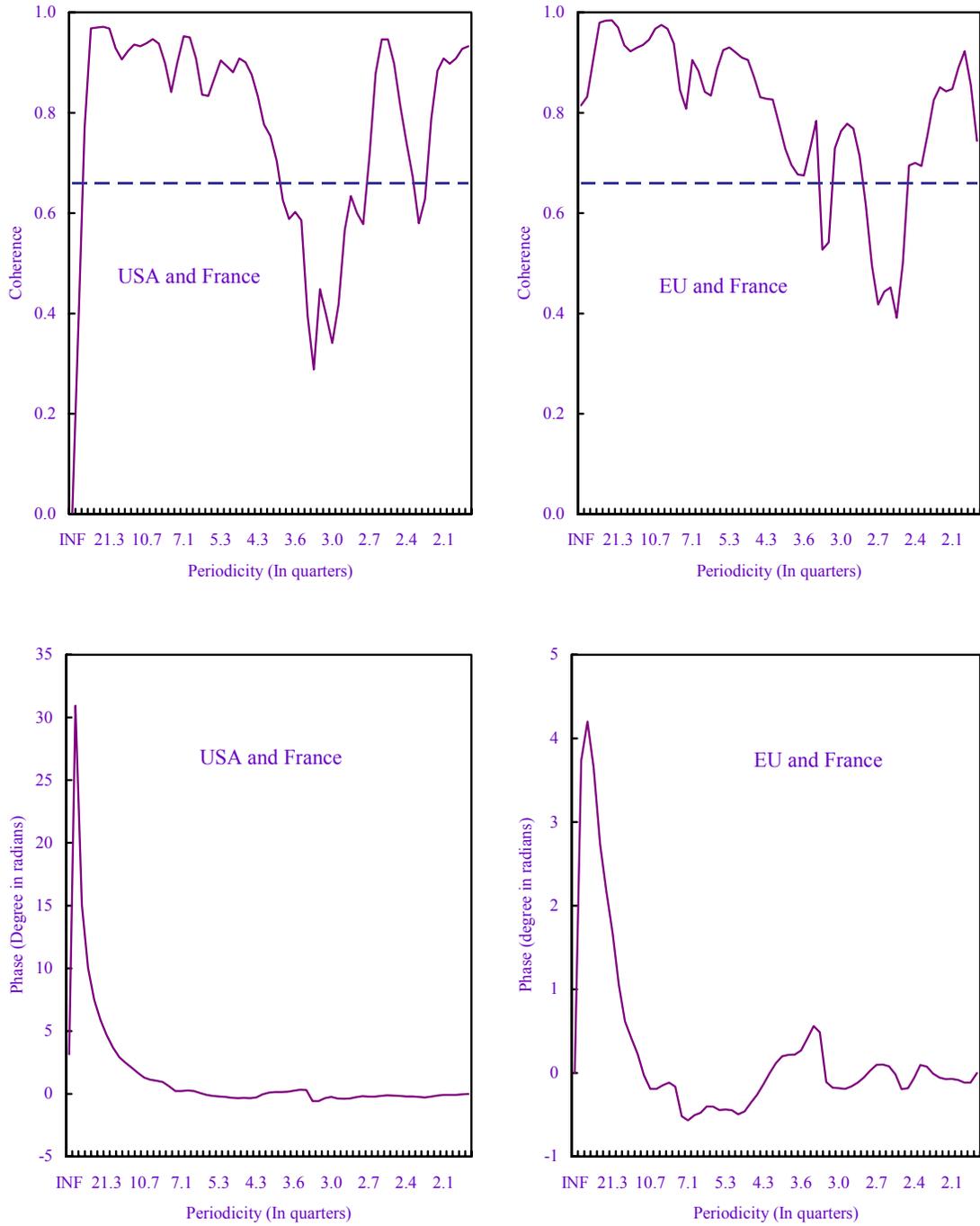


Figure 3. Common Components: Q2 1991 - Q4 2003
Shocks: USA GDP and EU (excluding France) GDP

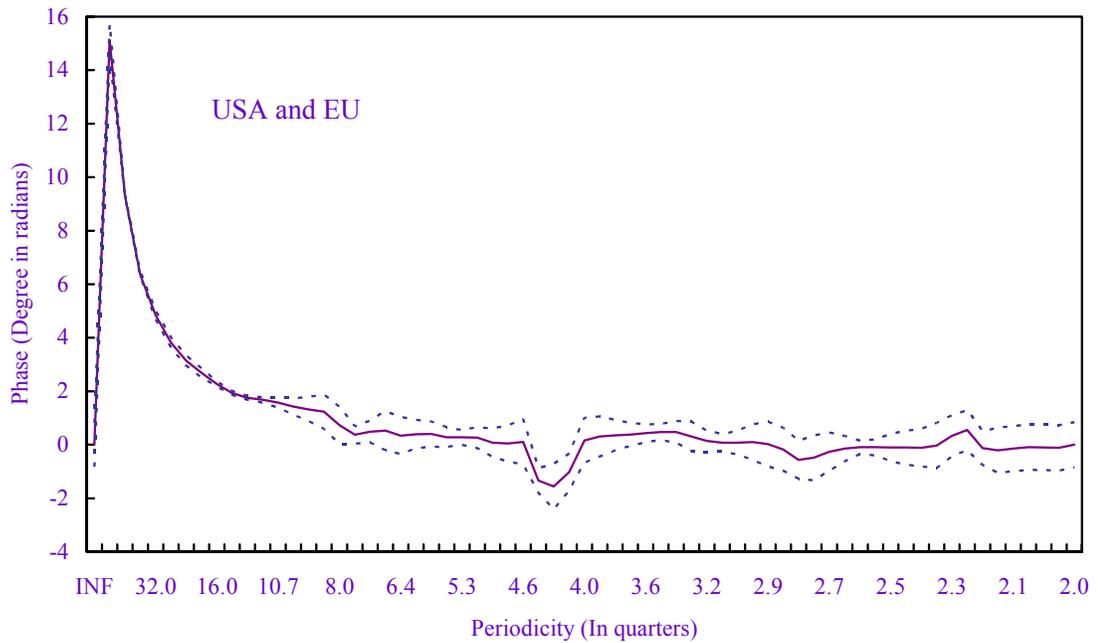
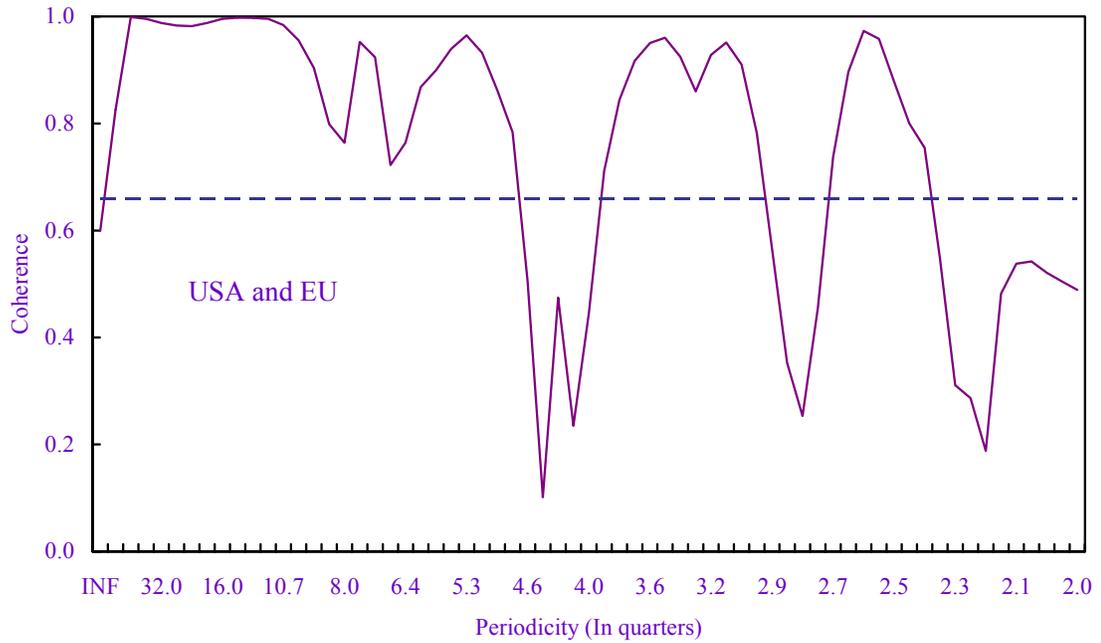


Table 1a. Forecast Error Variance of the Common Components of USA Variables Explained by the USA Supply Shock and the Demand Shock, 1980-2003 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals		Total Forecast Error Variance
			Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.54	0.87	0.30	0.92	0.11	0.05	0.67	0.53
Private investment	0.62	0.71	0.22	0.85	0.19	0.05	0.58	0.56
Personal consumption expenditure	0.32	0.87	0.40	0.93	0.04	0.02	0.33	0.29
Employment	0.60	0.75	0.11	0.82	0.21	0.12	0.83	0.58
Productivity	0.14	0.67	0.21	0.94	0.06	0.01	0.39	0.11
Capacity utilization	0.48	0.12	0.01	0.37	0.61	0.28	0.91	0.35
Government current disbursements	0.58	0.03	0.01	0.57	0.02	0.00	0.21	0.03
Government current receipts	0.25	0.34	0.00	0.37	0.39	0.15	0.77	0.18
Consumer confidence	0.66	0.11	0.01	0.32	0.50	0.32	0.91	0.41
Business confidence	0.74	0.74	0.15	0.86	0.24	0.09	0.79	0.73
Consumer prices	0.71	0.24	0.04	0.64	0.46	0.00	0.48	0.50
Short-term interest rates	0.36	0.15	0.01	0.48	0.83	0.22	0.90	0.36
Long-term interest rates	0.37	0.02	0.00	0.18	0.95	0.16	0.85	0.36
M1	0.44	0.19	0.02	0.38	0.60	0.11	0.81	0.35
Stock prices	0.09	0.56	0.04	0.75	0.02	0.00	0.25	0.05
Wages	0.32	0.31	0.00	0.28	0.42	0.27	0.88	0.23
Exports total	0.38	0.58	0.01	0.65	0.28	0.14	0.88	0.33
Imports total	0.45	0.71	0.22	0.85	0.24	0.06	0.66	0.43
Terms of trade	0.13	0.04	0.01	0.47	0.01	0.01	0.50	0.01
Real effective exchange	0.45	0.39	0.00	0.53	0.54	0.00	0.40	0.42
Current account balance	0.31	0.05	0.00	0.46	0.03	0.01	0.37	0.03
FDI out	0.03	0.04	0.01	0.56	0.26	0.02	0.57	0.01
FDI in	0.00	0.42	0.01	0.50	0.35	0.19	0.86	0.00

Table 1b. Forecast Error Variance of the Common Components of France Variables Explained by the USA Supply Shock and the Demand Shock, 1980-2003 1/

	Variance Shares of the Common Components	Supply Shock	Confidence Intervals		Demand Shock	Confidence Intervals		Total Forecast Error Variance
			Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.43	0.23	0.01	0.30	0.34	0.22	0.85	0.24
Private investment	0.67	0.28	0.01	0.35	0.11	0.08	0.74	0.26
Personal consumption expenditure	0.20	0.40	0.00	0.36	0.02	0.04	0.66	0.08
Employment	0.65	0.06	0.01	0.51	0.20	0.05	0.66	0.17
Productivity	0.22	0.60	0.00	0.47	0.11	0.09	0.73	0.16
Capacity utilization	0.57	0.53	0.07	0.72	0.01	0.01	0.32	0.31
Government current disbursements	0.88	0.09	0.00	0.43	0.06	0.00	0.20	0.14
Government current receipts	0.73	0.00	0.00	0.46	0.10	0.00	0.29	0.08
Consumer confidence	0.47	0.51	0.12	0.89	0.24	0.01	0.61	0.36
Business confidence	0.73	0.02	0.01	0.56	0.16	0.06	0.68	0.13
Consumer prices	0.84	0.07	0.00	0.45	0.15	0.00	0.22	0.18
Short-term interest rates	0.20	0.12	0.02	0.54	0.76	0.21	0.88	0.18
Long-term interest rates	0.31	0.12	0.02	0.47	0.84	0.19	0.88	0.29
M1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stock prices	0.05	0.57	0.09	0.76	0.04	0.00	0.40	0.03
Wages	0.75	0.14	0.04	0.71	0.19	0.00	0.41	0.25
Exports total	0.42	0.03	0.01	0.19	0.89	0.48	0.95	0.39
Imports total	0.37	0.12	0.01	0.28	0.46	0.24	0.86	0.21
Terms of trade	0.42	0.29	0.02	0.60	0.69	0.03	0.66	0.41
Real effective exchange	0.18	0.13	0.00	0.33	0.72	0.01	0.69	0.15
Current account balance	0.03	0.64	0.27	0.86	0.26	0.01	0.53	0.02
FDI out	0.00	0.62	0.03	0.70	0.32	0.21	0.93	0.00
FDI in	0.01	0.15	0.01	0.51	0.75	0.08	0.75	0.00

1/ Forecast horizon is 20 quarters and refers to the levels of the series. Confidence intervals are constructed using bootstrapping methods.

Table 2. Forecast Error Variance of the Common Components of German Variables Explained by the USA Supply Shock and the Demand Shock, 1980-2003 1/

	Variance Shares of the Common Components		Confidence Intervals		Demand Shocks	Confidence Intervals		Total Forecast Error Variance
	Supply Shocks		Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.78	0.003	0.001	0.321	0.066	0.001	0.478	0.05
Private investment	0.57	0.039	0.002	0.422	0.110	0.001	0.598	0.08
Personal consumption expenditure	0.78	0.024	0.002	0.341	0.007	0.004	0.273	0.02
Employment	0.87	0.131	0.003	0.444	0.043	0.004	0.302	0.15
Productivity	0.16	0.769	0.051	0.757	0.025	0.006	0.539	0.13
Capacity utilization	0.64	0.144	0.011	0.569	0.048	0.007	0.474	0.12
Government current disbursements	0.83	0.193	0.004	0.524	0.009	0.019	0.392	0.17
Government current receipts	0.76	0.082	0.003	0.371	0.030	0.005	0.283	0.08
Consumer confidence	0.52	0.130	0.005	0.486	0.012	0.007	0.536	0.07
Business confidence	0.62	0.057	0.005	0.440	0.146	0.035	0.636	0.13
Consumer prices	0.56	0.361	0.003	0.498	0.201	0.001	0.224	0.31
Short-term interest rates	0.43	0.158	0.027	0.592	0.601	0.165	0.836	0.33
Long-term interest rates	0.34	0.030	0.010	0.317	0.890	0.364	0.926	0.31
M1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stock prices	0.09	0.515	0.032	0.619	0.206	0.034	0.645	0.07
Wages	0.87	0.123	0.003	0.537	0.016	0.008	0.286	0.12
Exports total	0.34	0.164	0.007	0.221	0.487	0.283	0.910	0.22
Imports total	0.28	0.066	0.005	0.330	0.499	0.145	0.867	0.16
Terms of trade	0.57	0.287	0.009	0.561	0.670	0.019	0.663	0.55
Real effective exchange	0.31	0.342	0.006	0.569	0.613	0.008	0.585	0.29
Current account balance	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FDI out	0.01	0.594	0.099	0.815	0.256	0.005	0.388	0.01
FDI in	0.19	0.315	0.045	0.516	0.409	0.040	0.698	0.14

1/ Forecast horizon is 20 quarters and refers to the levels of the series. Confidence intervals are constructed using bootstrapping methods.

Table 3a. Forecast Error Variance of the Common Components of French Variables Explained by the USA Supply Shock and the Demand Shock, 1991-2003 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals		Total Forecast Error Variance
			Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.64	0.17	0.01	0.45	0.65	0.17	0.89	0.52
Private investment	0.72	0.36	0.01	0.46	0.37	0.15	0.88	0.53
Personal consumption expenditure	0.27	0.16	0.01	0.67	0.38	0.03	0.86	0.15
Employment	0.85	0.48	0.01	0.46	0.21	0.03	0.73	0.59
Productivity	0.42	0.05	0.00	0.47	0.68	0.05	0.82	0.31
Capacity Utilisation	0.73	0.38	0.01	0.75	0.07	0.02	0.47	0.33
Government current disbursements	0.63	0.53	0.01	0.68	0.20	0.06	0.88	0.46
Government current receipts	0.20	0.42	0.01	0.53	0.46	0.17	0.88	0.17
Consumer confidence	0.71	0.37	0.00	0.47	0.10	0.01	0.58	0.33
Business confidence	0.74	0.38	0.01	0.39	0.29	0.04	0.76	0.50
Consumer prices	0.32	0.35	0.00	0.62	0.07	0.01	0.65	0.13
Short-term interest rates	0.46	0.07	0.01	0.46	0.19	0.02	0.56	0.12
Long-term interest rates	0.75	0.03	0.00	0.47	0.22	0.02	0.74	0.19
M1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stock prices	0.22	0.58	0.01	0.59	0.17	0.01	0.56	0.16
Wages	0.63	0.20	0.01	0.53	0.32	0.02	0.71	0.33
Exports total	0.50	0.16	0.01	0.37	0.47	0.10	0.78	0.31
Imports total	0.50	0.37	0.01	0.46	0.50	0.28	0.90	0.43
Terms of trade	0.33	0.06	0.01	0.49	0.09	0.01	0.39	0.05
Real effective exchange	0.23	0.31	0.01	0.48	0.28	0.01	0.53	0.14
Current account balance	0.12	0.04	0.00	0.64	0.28	0.00	0.41	0.04
FDI out	0.01	0.09	0.01	0.74	0.75	0.08	0.91	0.01
FDI in	0.02	0.07	0.00	0.49	0.06	0.01	0.36	0.00

Table 3b. Forecast Error Variance of the Common Components of German Variables Explained by the USA Supply Shock and the Demand Shock, 1991-2003 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals		Total Forecast Error Variance
			Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.42	0.15	0.01	0.60	0.81	0.22	0.97	0.40
Private investment	0.37	0.16	0.01	0.56	0.81	0.22	0.93	0.36
Personal consumption expenditure	0.21	0.16	0.00	0.75	0.60	0.01	0.80	0.16
Employment	0.63	0.59	0.00	0.51	0.16	0.03	0.76	0.47
Productivity	0.42	0.12	0.01	0.61	0.80	0.05	0.83	0.38
Capacity utilization	0.80	0.30	0.00	0.42	0.11	0.01	0.69	0.32
Government current disbursements	0.61	0.52	0.00	0.58	0.00	0.00	0.47	0.32
Government current receipts	0.56	0.27	0.00	0.62	0.29	0.01	0.40	0.31
Consumer confidence	0.64	0.19	0.01	0.59	0.31	0.02	0.69	0.32
Business confidence	0.70	0.17	0.01	0.51	0.57	0.05	0.83	0.52
Consumer prices	0.57	0.37	0.00	0.57	0.01	0.01	0.62	0.22
Short-term interest rates	0.55	0.09	0.01	0.60	0.53	0.03	0.79	0.34
Long-term interest rates	0.37	0.02	0.00	0.47	0.21	0.01	0.74	0.09
M1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stock prices	0.30	0.56	0.01	0.59	0.25	0.01	0.67	0.24
Wages	0.63	0.29	0.01	0.82	0.33	0.00	0.57	0.39
Exports total	0.39	0.44	0.01	0.51	0.30	0.09	0.83	0.29
Imports total	0.39	0.45	0.01	0.54	0.46	0.22	0.91	0.36
Terms of trade	0.24	0.14	0.01	0.46	0.19	0.02	0.63	0.08
Real effective exchange	0.15	0.47	0.01	0.54	0.21	0.03	0.79	0.10
Current account balance	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FDI out	0.01	0.22	0.01	0.65	0.06	0.02	0.40	0.00
FDI in	0.23	0.31	0.01	0.41	0.24	0.02	0.63	0.13

1/ Forecast horizon is 20 quarters and refers to the levels of the series. Confidence intervals are constructed using bootstrapping methods.

Table 4a. Forecast Error Variance of the Common Components of French Variables Explained by the G7 Excluding France Supply Shock and the Demand Shock, 1991-2003 1/

	Variance Shares of the Common Components	Supply Shock	Confidence Intervals		Demand Shock	Confidence Intervals		Total Forecast Error Variance
			Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.64	0.11	0.01	0.35	0.81	0.41	0.96	0.59
Private investment	0.72	0.33	0.01	0.52	0.43	0.17	0.90	0.55
Personal consumption expenditure	0.27	0.18	0.01	0.44	0.31	0.07	0.80	0.13
Employment	0.85	0.47	0.01	0.61	0.28	0.03	0.74	0.63
Productivity	0.42	0.15	0.01	0.41	0.79	0.16	0.91	0.39
Capacity utilization	0.73	0.32	0.03	0.73	0.09	0.01	0.37	0.30
Government current disbursements	0.63	0.59	0.01	0.79	0.16	0.03	0.77	0.47
Government current receipts	0.20	0.34	0.01	0.60	0.55	0.11	0.85	0.17
Consumer confidence	0.71	0.38	0.01	0.54	0.18	0.01	0.60	0.39
Business confidence	0.74	0.32	0.01	0.49	0.46	0.09	0.81	0.57
Consumer prices	0.32	0.52	0.00	0.71	0.00	0.00	0.39	0.17
Short-term interest rates	0.46	0.09	0.01	0.39	0.57	0.07	0.72	0.30
Long-term interest rates	0.75	0.09	0.00	0.39	0.58	0.19	0.89	0.50
M1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stock prices	0.22	0.58	0.01	0.70	0.15	0.00	0.34	0.16
Wages	0.63	0.16	0.02	0.41	0.52	0.07	0.79	0.43
Exports total	0.50	0.06	0.01	0.32	0.83	0.32	0.90	0.44
Imports total	0.50	0.27	0.01	0.55	0.69	0.35	0.95	0.48
Terms of trade	0.33	0.02	0.00	0.38	0.43	0.01	0.55	0.15
Real effective exchange	0.23	0.20	0.01	0.53	0.48	0.01	0.51	0.16
Current account balance	0.12	0.08	0.00	0.53	0.03	0.00	0.43	0.01
FDI out	0.01	0.07	0.01	0.57	0.56	0.09	0.83	0.01
FDI in	0.02	0.23	0.00	0.43	0.30	0.01	0.58	0.01

Table 4b. Forecast Error Variance of the Common Components of French Variables Explained by the Euro Area Excluding France Supply Shock and the Demand Shock, 1991-2003 1/

	Variance Shares of the Common Components	Supply Shock	Confidence Intervals		Demand Shock	Confidence Intervals		Total Forecast Error Variance
			Lower Bound	Upper Bound		Lower Bound	Upper Bound	
GDP	0.64	0.77	0.09	0.91	0.21	0.05	0.88	0.63
Private investment	0.72	0.80	0.12	0.92	0.04	0.02	0.74	0.61
Personal consumption expenditure	0.27	0.53	0.01	0.78	0.07	0.03	0.82	0.16
Employment	0.85	0.80	0.07	0.88	0.04	0.01	0.62	0.71
Productivity	0.42	0.20	0.00	0.48	0.65	0.12	0.91	0.35
Capacity utilization	0.73	0.26	0.05	0.50	0.15	0.01	0.52	0.30
Government current disbursements	0.63	0.67	0.15	0.93	0.10	0.01	0.52	0.49
Government current receipts	0.20	0.93	0.08	0.91	0.03	0.02	0.74	0.19
Consumer confidence	0.71	0.61	0.04	0.78	0.04	0.01	0.58	0.46
Business confidence	0.74	0.84	0.08	0.88	0.04	0.02	0.72	0.65
Consumer prices	0.32	0.30	0.01	0.75	0.19	0.00	0.39	0.16
Short-term interest rates	0.46	0.32	0.02	0.64	0.32	0.03	0.69	0.29
Long-term interest rates	0.75	0.17	0.01	0.72	0.34	0.01	0.65	0.38
M1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stock prices	0.22	0.67	0.01	0.70	0.09	0.00	0.36	0.17
Wages	0.63	0.66	0.03	0.76	0.14	0.03	0.80	0.51
Exports total	0.50	0.66	0.05	0.77	0.19	0.04	0.77	0.43
Imports total	0.50	0.93	0.25	0.95	0.06	0.02	0.73	0.49
Terms of trade	0.33	0.24	0.01	0.56	0.14	0.01	0.45	0.13
Real effective exchange	0.23	0.74	0.01	0.71	0.03	0.01	0.56	0.18
Current account balance	0.12	0.11	0.01	0.59	0.00	0.00	0.36	0.01
FDI out	0.01	0.41	0.02	0.65	0.13	0.03	0.62	0.01
FDI in	0.02	0.03	0.01	0.42	0.38	0.01	0.59	0.01

1/ Forecast horizon is 20 quarters and refers to the levels of the series. Confidence intervals are constructed using bootstrapping methods.

APPENDIX I. Macroeconomic Series

Number	Country	Variable Name	Unit	Root	Log	Treatment
1	France	Balance of income, value, balance of payments basis		1	nl	2
2	France	Current account, value		1	nl	2
3	France	Government consumption of fixed capital, value		1	1	3
4	France	Private final consumption expenditure, volume \ euros 1995		1	1	3
5	France	Dependent employment \ persons		1	1	3
6	France	Dependent employment of the business sector \ persons		1	1	3
7	France	Government employment \ persons		1	1	3
8	France	Self-employed \ persons		1	1	3
9	France	Total employment \ persons		1	1	3
10	France	Exchange rate, index of US\$ per local currency \ index		1	1	3
11	France	Employment of the business sector \ persons		1	1	3
12	France	Real Effective exchange rate, 2000 = 100, ULC-based		1	1	3
13	France	Gross domestic product, volume, market prices \ euros 1995		1	1	3
14	France	Private nonresidential fixed capital formation, volume \ euros 1995		1	1	3
15	France	Fixed investment in nonresidential construction, volume		1	1	3
16	France	Government fixed capital formation, volume \ euros 1995		1	1	3
17	France	Private residential fixed capital formation, volume \ euros 1995		1	1	3
18	France	Fixed investment in machinery and equipment, volume \ euros		1	1	3
19	France	Industrial production \ index 1995		1	1	3
20	France	Private total fixed capital formation, volume \ euros 1995		1	1	3
21	France	Long-term interest rate on government bonds \ percent		1	nl	2
22	France	Gross total fixed capital formation, volume \ euros 1995		1	1	3
23	France	Labor force \ persons		1	1	3
24	France	Labor force participation rate		1	1	3
25	France	Imports of goods and services, volume, national accounts basis \ euros		1	1	3
26	France	Factor income paid abroad, volume, balance of payments basis \ local currency		1	1	3
27	France	Labor productivity of the total economy \ index 2000		1	1	3
28	France	Labor productivity of the business economy \ euros		1	1	3
29	France	Government saving (net), value \ euros		1	nl	2
30	France	Household saving ratio \ percent		1	nl	2
31	France	Current transfers received by households, value \ euros		1	1	3
32	France	Unit labor cost of the total economy \ index 2000		1	1	3
33	France	Unit labor cost of the manufacturing sector \ index 1995		1	1	3
34	France	Unemployment \ persons		1	1	3
35	France	Unemployment rate \ percent		1	nl	2
36	France	Wages, value \ euros		1	1	3
37	France	Wages of the government sector, value \ euros		1	1	3
38	France	Compensation rate of government employees \ euros		1	1	3
39	France	Wage rate of the manufacturing sector, hourly earnings \ index 1995		1	nl	2
40	France	Compensation rate of the business sector \ yearly salary in euro		1	1	3
41	France	Compensation of employees, value \ euros		1	1	3
42	France	Exports of goods and services, volume, national accounts basis \ euros 1995		1	1	3
43	France	Factor income from abroad, volume, balance of payments basis \ local currency		1	1	3
44	France	Property income received by households, value \ euros		1	1	3
45	France	Government current disbursements, value \ euros		1	1	3
46	France	Current disbursements of households, value \ euros		1	1	3
47	France	Government current receipts, value \ euros		1	1	3
48	France	Current receipts of households, value \ euros		1	1	3
49	France	Self-employment income received by households, value \ euros		1	1	3
50	France	Direct Investment abroad		1	nl	2
51	France	Dir. invest. in rep. econ., N.I.E.		1	nl	2
52	France	Portfolio investment liab., N.I.E.		1	nl	2
53	France	Exports prices		1	1	3
54	France	Imports prices		1	1	3
55	France	Terms of trade		1	1	3
56	France	CPI: 108 cities (index number, 2000=100, AQM, DEC, average)		1	1	3
57	France	France\interest rates\confidence and economic sentiment\share prices SBF 250 / stock		1	1	3
58	France	Treasury bills: 3 months (percent per annum, AQM, DEC, average)		1	nl	2
59	France	Cyclical indicators\surveys of manufacturing industry\industrial confidence indicator		0	nl	0
60	France	\Cyclical indicators\consumer opinion on economic and financial		0	nl	0
61	France	Fixed investment in construction, volume		0	1	1
62	France	Increase in stocks, volume \ euros 1995		0	nl	0
63	France	Wage rate of the business sector \ euros per		0	1	1
64	France	Household disposable income, real \ euros		0	1	1
65	France	France\cyclical indicators\surveys of manufacturing industry\current level of capacity		0	1	1
66	France	Portfolio investment assets		0	nl	0
67	France	Other investment assets		0	nl	0
68	France	Other investment liab., N.I.E.		0	nl	0
69	France	Financial account, N.I.E.		0	nl	0
70	Germany	Government consumption of fixed capital, value \ euros		1	1	3
71	Germany	Private final consumption expenditure, volume \ euros 1995		1	1	3
72	Germany	Dependent employment \ persons		1	1	3
73	Germany	Dependent employment of the business sector		1	1	3
74	Germany	Government employment \ persons		1	1	3
75	Germany	Self-employed \ persons		1	1	3
76	Germany	Total employment \ persons		1	1	3
77	Germany	Employment of the business sector		1	1	3
78	Germany	Exchange rate, index of US\$ per local currency \ index		1	1	3
79	Germany	Real Effective exchange rate, 2000 = 100, ULC-based		1	1	3
80	Germany	Gross domestic product, volume, market prices \ euros 1995		1	1	3
81	Germany	Private nonresidential fixed capital formation, volume \ euros 1995		1	1	3

APPENDIX I. Macroeconomic Series (continued)

Number	Country	Variable Name	Unit	Root	Log	Treatment
82	Germany	Fixed investment in nonresidential construction, volume	1	1	1	3
83	Germany	Fixed investment in construction, volume \ DM	1	1	1	3
84	Germany	Government fixed capital formation, volume \ euros 1995	1	1	1	3
85	Germany	Private residential fixed capital formation, volume \ euros 1995	1	1	1	3
86	Germany	Fixed investment in machinery and equipment, volume \ DM	1	1	1	3
87	Germany	Industrial production	1	1	1	3
88	Germany	Private total fixed capital formation, volume \ euros 1995	1	1	1	3
89	Germany	Long-term interest rate on government bonds \ percent	1	nl	1	2
90	Germany	Gross total fixed capital formation, volume \ euros 1995	1	1	1	3
91	Germany	Labor force	1	1	1	3
92	Germany	Imports of goods and services, volume, national accounts basis \ euros 1995	1	1	1	3
93	Germany	Labor productivity of the total economy \ index 2000	1	1	1	3
94	Germany	Labor productivity of the business economy	1	1	1	3
95	Germany	Government saving (net), value \ euros	1	nl	1	2
96	Germany	Current transfers received by households, value	1	1	1	3
97	Germany	Unit labor cost of the total economy	1	1	1	3
98	Germany	Unit labor cost of the manufacturing sector \ Local currency index	1	1	1	3
99	Germany	Unemployment \ euros	1	1	1	3
100	Germany	Unemployment rate \ percent	1	nl	1	2
101	Germany	Wages, value \ euros	1	1	1	3
102	Germany	Wage rate of the business sector	1	1	1	3
103	Germany	Compensation rate of government employees	1	1	1	3
104	Germany	Compensation rate of the business sector \ DM	1	1	1	3
105	Germany	Compensation of employees, value \ euros	1	1	1	3
106	Germany	Exports of goods and services, volume, national accounts basis \ euros 1995	1	1	1	3
107	Germany	Household disposable income, real \ euros	1	1	1	3
108	Germany	Government current disbursements, value \ euros	1	1	1	3
109	Germany	Current disbursements of households, value \ euros	1	1	1	3
110	Germany	Government current receipts, value \ euros	1	1	1	3
111	Germany	Current receipts of households, value \ euros	1	1	1	3
112	Germany	Direct Investment abroad	1	nl	1	2
113	Germany	Portfolio investment assets	1	nl	1	2
114	Germany	Portfolio investment liab., N.I.E.	1	nl	1	2
115	Germany	Exports prices	1	1	1	3
116	Germany	Imports prices	1	1	1	3
117	Germany	Terms of trade	1	1	1	3
118	Germany	Share prices (Index number, AQM, DEC, average)	1	1	1	3
119	Germany	Call money rate (percent per annum, AQM, DEC, average)	1	nl	1	2
120	Germany	Consumer Price Index (SA, 2000=100)	1	1	1	3
121	Germany	PPI: total manufacturing industries (SA, 2000=100)	1	1	1	3
122	Germany	Cyclical indicators\surveys of manufacturing industry\industrial confidence indicator	0	nl	0	0
123	Germany	Cyclical indicators\consumer opinion on economic and financial	0	nl	0	0
124	Germany	Increase in stocks, volume \ euros 1995	0	nl	0	0
125	Germany	Household saving ratio \ percent	0	nl	0	0
126	Germany	The Federal Republic of Germany (prior to 1990Q4 West-Germany)\cyclical	0	1	1	1
127	Germany	Dir. Invest. in Rep. Econ., N.I.E.	0	nl	0	0
128	Germany	Other investment assets	0	nl	0	0
129	Germany	Other investment liab., N.I.E.	0	nl	0	0
130	Germany	Financial account, N.I.E.	0	nl	0	0
131	Italy	Balance of income, value, balance of payments basis	1	nl	1	2
132	Italy	Current account, value	1	nl	1	2
133	Italy	Government consumption of fixed capital, value \ euros	1	1	1	3
134	Italy	Private final consumption expenditure, volume \ euros 1995	1	1	1	3
135	Italy	Dependent employment \ persons	1	1	1	3
136	Italy	Self-employed \ persons	1	1	1	3
137	Italy	Total employment \ persons	1	1	1	3
138	Italy	Employment of the business sector \ persons	1	1	1	3
139	Italy	Exchange rate, index of US\$ per local currency \ index	1	1	1	3
140	Italy	Private non-residential fixed capital formation, volume \ euros	1	1	1	3
141	Italy	Fixed investment in non-residential construction, volume \ euros	1	1	1	3
142	Italy	Fixed investment in construction, volume \ euros	1	1	1	3
143	Italy	Government fixed capital formation, volume \ euros	1	1	1	3
144	Italy	Private residential fixed capital formation, volume \ euros	1	1	1	3
145	Italy	Fixed investment in machinery and equipment, volume \ euros	1	1	1	3
146	Italy	Industrial production \ index 1995	1	1	1	3
147	Italy	Private total fixed capital formation, volume \ euros	1	1	1	3
148	Italy	Long-term interest rate on government bonds \ percent	1	nl	1	2
149	Italy	Gross total fixed capital formation, volume \ euros	1	1	1	3
150	Italy	Capital stock of the business sector, volume \ euros	1	1	1	3
151	Italy	Capital stock, housing, volume	1	1	1	3
152	Italy	Labor force \ persons	1	1	1	3
153	Italy	Labor force participation rate	1	nl	1	2
154	Italy	Imports of goods and services, volume, national accounts basis \ euros	1	1	1	3
155	Italy	Factor income paid abroad, volume, balance of payments basis \ local currency	1	1	1	3
156	Italy	Labor productivity of the total economy \ index 2000	1	1	1	3
157	Italy	Labor productivity of the business economy \ euros	1	1	1	3
158	Italy	Government saving (net), value \ euros	1	nl	1	2
159	Italy	Household saving, value \ euros	1	1	1	3
160	Italy	Household saving ratio \ percent	1	nl	1	2
161	Italy	Current transfers received by households, value \ euros	1	1	1	3
162	Italy	Unit labor cost of the total economy \ local currency	1	1	1	3

APPENDIX I. Macroeconomic Series (continued)

Number	Country	Variable Name	Unit Root	Log	Treatment
163	Italy	Unit labor cost of the manufacturing sector \ local currency index	1	1	3
164	Italy	Unemployment \ persons	1	1	3
165	Italy	Unemployment rate \ percent	1	nl	2
166	Italy	Wages, value \ euros	1	1	3
167	Italy	Wage rate of the business sector \ euros/person	1	1	3
168	Italy	Compensation rate of government employees \ euros/person	1	1	3
169	Italy	Wage rate of the manufacturing sector, hourly earnings \ index 1995	1	1	3
170	Italy	Compensation rate of the business sector \ yearly salary in euros per	1	1	3
171	Italy	Compensation of employees, value \ euros	1	1	3
172	Italy	Exports of goods and services, volume, national accounts basis \ euros	1	1	3
173	Italy	Factor income from abroad, volume, balance of payments basis \ local currency	1	1	3
174	Italy	Household disposable income, real \ euros	1	1	3
175	Italy	Property income received by households, value \ euros	1	1	3
176	Italy	Government current disbursements, value \ euros	1	1	3
177	Italy	Current disbursements of households, value \ euros	1	1	3
178	Italy	Government current receipts, value \ euros	1	1	3
179	Italy	Current receipts of households, value \ euros	1	1	3
180	Italy	Self-employment income received by households, value \ euros	1	1	3
181	Italy	Portfolio investment liab., N.I.E.	1	nl	2
182	Italy	Exports prices	1	1	3
183	Italy	Imports prices	1	1	3
184	Italy	Terms of trade	1	1	3
185	Italy	CPI: all Italy (index number, 2000=100, AQM, DEC, average)	1	1	3
186	Italy	Italy\interest rates\confidence and economic sentiment\share prices ISE MIB	1	1	3
187	Italy	Money market rate (percent per annum, AQM, DEC, average)	1	nl	2
188	Italy	Real Effective exchange rate, 2000 = 100, ULC-based	0	1	1
189	Italy	Gross domestic product, volume, market prices \ EUROS 1995	0	1	1
190	Italy	Increase in stocks, volume \ EUROS	0	nl	0
191	Italy	Italy\cyclical indicators\surveys of manufacturing industry:\current level of capacity	0	1	1
192	Italy	Direct investment abroad	0	nl	0
193	Italy	Dir. invest. in rep. econ., N.I.E.	0	nl	0
194	Italy	Portfolio investment assets	0	nl	0
195	Italy	Other investment assets	0	nl	0
196	Italy	Other investment liab., N.I.E.	0	nl	0
197	Italy	Financial account, N.I.E.	0	nl	0
198	Japan	Balance of income, value, balance of payments basis	1	nl	2
199	Japan	Current account, value	1	nl	2
200	Japan	Government consumption of fixed capital, value \ JPY	1	1	3
201	Japan	Private final consumption expenditure, volume \ JPY 2000	1	1	3
202	Japan	Dependent employment \ persons	1	1	3
203	Japan	Dependent employment of the business sector \ persons	1	1	3
204	Japan	Government employment \ persons	1	1	3
205	Japan	Self-employed \ persons	1	1	3
206	Japan	Total employment \ persons	1	1	3
207	Japan	Employment of the business sector \ persons	1	1	3
208	Japan	Exchange rate, index of US\$ per local currency \ index	1	1	3
209	Japan	Real Effective exchange rate, 2000 = 100, ULC-based	1	1	3
210	Japan	Gross domestic product, volume, market prices \ JPY 2000	1	1	3
211	Japan	Private non-residential fixed capital formation, volume \ JPY 2000	1	1	3
212	Japan	Fixed investment of government enterprises, volume \ JPY 2000	1	1	3
213	Japan	Government fixed capital formation, volume \ JPY 2000	1	1	3
214	Japan	Private residential fixed capital formation, volume \ JPY 2000	1	1	3
215	Japan	Industrial production \ index 2000	1	1	3
216	Japan	Private total fixed capital formation, volume \ JPY 2000	1	1	3
217	Japan	Long-term interest rate on government bonds \ percent	1	nl	2
218	Japan	Gross total fixed capital formation, volume \ JPY 2000	1	1	3
219	Japan	Capital stock of the business sector, volume \ JPY 2000	1	1	3
220	Japan	Capital stock, housing, volume \ JPY 2000	1	1	3
221	Japan	Labor force \ persons	1	1	3
222	Japan	Labor force participation rate	1	nl	2
223	Japan	Imports of goods and services, volume, national accounts basis \ JPY 2000	1	1	3
224	Japan	Money supply, broad definition: M2 or M3 \ JPY	1	1	3
225	Japan	Factor income paid abroad, volume, balance of payments basis \ local currency	1	1	3
226	Japan	Labor productivity of the total economy \ index 2000	1	1	3
227	Japan	Labor productivity of the business economy	1	1	3
228	Japan	Government saving (net), value \ JPY	1	nl	2
229	Japan	Household saving, value \ JPY	1	1	3
230	Japan	Household saving ratio \ percent	1	nl	2
231	Japan	Unit labor cost of the total economy \ index 2000	1	1	3
232	Japan	Unit labor cost of the manufacturing sector \ index 2000	1	1	3
233	Japan	Unemployment \ persons	1	1	3
234	Japan	Unemployment rate \ percent	1	nl	2
235	Japan	Velocity of money	1	1	3
236	Japan	Wages, value \ JPY	1	1	3
237	Japan	Wage rate of the business sector \ index	1	1	3
238	Japan	Compensation rate of government employees	1	1	3
239	Japan	Wage rate of the manufacturing sector, hourly earnings \ index 2000	1	1	3
240	Japan	Compensation rate of the business sector \ yearly salary in yen per	1	1	3
241	Japan	Compensation of employees, value \ JPY	1	1	3
242	Japan	Exports of goods and services, volume, national accounts basis \ JPY 2000	1	1	3
243	Japan	Factor income from abroad, volume, balance of payments basis \ local currency	1	1	3

APPENDIX I. Macroeconomic Series (continued)

Number	Country	Variable Name	Unit	Root	Log	Treatment
244	Japan	Household disposable income, real \ JPY		1	1	3
245	Japan	Property income received by households, value \ JPY		1	1	3
246	Japan	Government current disbursements, value \ JPY		1	1	3
247	Japan	Current disbursements of households, value \ JPY		1	1	3
248	Japan	Government current receipts, value \ JPY		1	1	3
249	Japan	Current receipts of households, value \ JPY		1	1	3
250	Japan	Self-employment income received by households, value \ JPY		1	1	3
251	Japan	Direct Investment abroad		1	nl	2
252	Japan	Portfolio investment assets		1	nl	2
253	Japan	Financial account, N.I.E.		1	nl	2
254	Japan	Exports prices		1	1	3
255	Japan	Imports prices		1	1	3
256	Japan	Terms of trade		1	1	3
257	Japan	Call monetary rate (percent per annum, AQM, DEC, average)		1	nl	2
258	Japan	Share prices (index number, AQM, DEC, average)		1	1	3
259	Japan	PPI / WPI (Index number, 2000=100, AQM, DEC, average)		1	1	3
260	Japan	CPI: all Japan-485 items (Index number, 2000=100, AQM, DEC, average)		1	1	3
261	Japan	Increase in stocks, volume \ JPY 2000		0	nl	0
262	Japan	Current transfers received by households, value \ JPY		0	1	1
263	Japan	Dir. invest. in rep. econ., N.I.E.		0	nl	0
264	Japan	Portfolio investment liab., N.I.E.		0	nl	0
265	Japan	Other investment liab., N.I.E.		0	nl	0
266	Spain	Balance of income, value, balance of payments basis		1	nl	2
267	Spain	Current account, value		1	nl	2
268	Spain	Government consumption of fixed capital, value \ euros		1	1	3
269	Spain	Unit capital-labor costs		1	1	3
270	Spain	Private final consumption expenditure, volume \ euros		1	1	3
271	Spain	Dependent employment \ persons		1	1	3
272	Spain	Dependent employment of the business sector \ persons		1	1	3
273	Spain	Government employment \ persons		1	1	3
274	Spain	Self-employed \ persons		1	1	3
275	Spain	Total employment \ persons		1	1	3
276	Spain	Employment of the business sector \ persons		1	1	3
277	Spain	Exchange rate, index of US\$ per local currency \ index		1	1	3
278	Spain	Real Effective exchange rate, 2000 = 100, ULC-based		1	1	3
279	Spain	Gross domestic product, volume, market prices \ euros		1	1	3
280	Spain	Private non-residential fixed capital formation, volume \ euros		1	1	3
281	Spain	Fixed investment in non-residential construction, volume \ euros		1	1	3
282	Spain	Fixed investment in construction, volume		1	1	3
283	Spain	Government fixed capital formation, volume \ euros		1	1	3
284	Spain	Private residential fixed capital formation, volume \ euros		1	1	3
285	Spain	Fixed investment in machinery and equipment, volume \ euros		1	1	3
286	Spain	Industrial production \ index		1	1	3
287	Spain	Private total fixed capital formation, volume \ euros		1	1	3
288	Spain	Long-term interest rate on government bonds \ percent		1	nl	2
289	Spain	Gross total fixed capital formation, volume \ euros		1	1	3
290	Spain	Labor force \ persons		1	1	3
291	Spain	Imports of goods and services, volume, national accounts basis \ euros		1	1	3
292	Spain	Factor income paid abroad, volume, balance of payments basis \ local currency		1	1	3
293	Spain	Labor productivity of the total economy \ index		1	1	3
294	Spain	Labor productivity of the business economy \ euros		1	1	3
295	Spain	Government saving (net), value \ euros		1	nl	2
296	Spain	Household saving, value \ euros		1	1	3
297	Spain	Current transfers received by households, value \ euros		1	1	3
298	Spain	Unit labor cost of the total economy \ index		1	1	3
299	Spain	Unit labor cost of the manufacturing sector \ index		1	1	3
300	Spain	Unemployment \ persons		1	1	3
301	Spain	Unemployment rate \ percent		1	nl	2
302	Spain	Wages, value \ euros		1	1	3
303	Spain	Wage rate of the business sector \ euros/man/year		1	1	3
304	Spain	Compensation rate of government employees \ euros		1	1	3
305	Spain	Compensation rate of the business sector \ yearly salary in euros		1	1	3
306	Spain	Compensation of employees, value \ euros		1	1	3
307	Spain	Exports of goods and services, volume, national accounts basis \ euros		1	1	3
308	Spain	Factor income from abroad, volume, balance of payments basis \ local currency		1	1	3
309	Spain	Household disposable income, real \ euros		1	1	3
310	Spain	Property income received by households, value \ euros		1	1	3
311	Spain	Government current disbursements, value \ euros		1	1	3
312	Spain	Current disbursements of households, value \ euros		1	1	3
313	Spain	Government current receipts, value \ euros		1	1	3
314	Spain	Current receipts of households, value \ euros		1	1	3
315	Spain	Self-employment income received by households, value \ euros		1	1	3
316	Spain	Other investment liab., N.I.E.		1	nl	2
317	Spain	Exports Prices		1	1	3
318	Spain	Terms of Trade		1	1	3
319	Spain	Call money rate (percent per annum, AQM, DEC, average)		1	nl	2
320	Spain	Share prices (index number, AQM, DEC, average)		1	1	3
321	Spain	PPI / WPI (index number, 2000=100, AQM, DEC, average)		1	1	3
322	Spain	CPI: (no specifics avail.) (index number, 2000=100, AQM, DEC, average)		1	1	3
323	Spain	Increase in stocks, volume \ euros		0	nl	0
324	Spain	Household saving ratio \ ratio		0	nl	0

APPENDIX I. Macroeconomic Series (continued)

Number	Country	Variable Name	Unit	Root	Log	Treatment
325	Spain	Direct investment abroad		0	nl	0
326	Spain	Dir. Invest. in rep. econ., N.I.E.		0	nl	0
327	Spain	Portfolio investment liab., N.I.E.		0	nl	0
328	Spain	Other investment assets		0	nl	0
329	Spain	Financial account, N.I.E.		0	nl	0
330	Spain	Imports Prices		0	l	1
331	United Kingdom	Balance of income, value, balance of payments basis		1	nl	2
332	United Kingdom	Current account, value		1	nl	2
333	United Kingdom	Government consumption of fixed capital, value \ GBP		1	l	3
334	United Kingdom	Unit capital-labor costs		1	l	3
335	United Kingdom	Private final consumption expenditure, volume \ 2001 GBP		1	l	3
336	United Kingdom	Dependent employment \ persons		1	l	3
337	United Kingdom	Dependent employment of the business sector \ persons		1	l	3
338	United Kingdom	Government employment \ persons		1	l	3
339	United Kingdom	Self-employed \ persons		1	l	3
340	United Kingdom	Total employment \ persons		1	l	3
341	United Kingdom	Employment of the business sector \ persons		1	l	3
342	United Kingdom	Exchange rate, index of US\$ per local currency \ index		1	l	3
343	United Kingdom	Real Effective exchange rate, 2000 = 100, ULC-based		1	l	3
344	United Kingdom	Gross domestic product, volume, market prices \ 2001 GBP		1	l	3
345	United Kingdom	Private non-residential fixed capital formation, volume \ GBP		1	l	3
346	United Kingdom	Fixed investment in construction, volume \ GBP 2001		1	l	3
347	United Kingdom	Government fixed capital formation, volume \ GBP 00		1	l	3
348	United Kingdom	Private residential fixed capital formation, volume \ 2001 GBP		1	l	3
349	United Kingdom	Fixed investment in machinery and equipment, volume \ GBP 2001		1	l	3
350	United Kingdom	Private total fixed capital formation, volume \ GBP 00		1	l	3
351	United Kingdom	Long-term interest rate on government bonds \ percent		1	nl	2
352	United Kingdom	Increase in stocks, volume \ 2001 GBP		1	nl	2
353	United Kingdom	Gross total fixed capital formation, volume \ 2001 GBP		1	l	3
354	United Kingdom	Capital stock of the business sector, volume \ GBP 2001		1	l	3
355	United Kingdom	Labor force \ persons		1	l	3
356	United Kingdom	Labor force participation rate		1	nl	2
357	United Kingdom	Imports of goods and services, volume, national accounts basis \ GBP 2001		1	l	3
358	United Kingdom	Factor income paid abroad, volume, balance of payments basis \ GBP		1	l	3
359	United Kingdom	Labor productivity of the total economy \ index 2000		1	l	3
360	United Kingdom	Labor productivity of the business economy		1	l	3
361	United Kingdom	Household saving, value \ GBP		1	l	3
362	United Kingdom	Household saving ratio \ percent		1	nl	2
363	United Kingdom	Current transfers received by households, value \ GBP		1	l	3
364	United Kingdom	Unit labor cost of the total economy \ index 2000		1	l	3
365	United Kingdom	Unit labor cost of the manufacturing sector \ index 2001		1	l	3
366	United Kingdom	Unemployment \ persons		1	l	3
367	United Kingdom	Wages, value \ GBP		1	l	3
368	United Kingdom	Wage rate of the business sector \ GBP		1	l	3
369	United Kingdom	Compensation rate of government employees \ GBP		1	l	3
370	United Kingdom	Wage rate of the manufacturing sector, hourly earnings \ index 2001		1	l	3
371	United Kingdom	Compensation rate of the business sector \ yearly salary in GBP		1	l	3
372	United Kingdom	Compensation of employees, value \ GBP		1	l	3
373	United Kingdom	Exports of goods and services, volume, national accounts basis \ 2001 GBP		1	l	3
374	United Kingdom	Factor income from abroad, volume, balance of payments basis \ GBP		1	l	3
375	United Kingdom	Household disposable income, real \ GBP		1	l	3
376	United Kingdom	Property income received by households, value		1	l	3
377	United Kingdom	Government current disbursements, value \ GBP		1	l	3
378	United Kingdom	Current disbursements of households, value \ GBP		1	l	3
379	United Kingdom	Government current receipts, value \ GBP		1	l	3
380	United Kingdom	Current receipts of households, value \ GBP		1	l	3
381	United Kingdom	Self-employment income received by households, value \ GBP		1	l	3
382	United Kingdom	Exports prices		1	l	3
383	United Kingdom	Imports prices		1	l	3
384	United Kingdom	Terms of trade		1	l	3
385	United Kingdom	Overnight interbank min (percent per annum, AQM, DEC, average)		1	nl	2
386	United Kingdom	United Kingdom - PPI / WPI (index number, 2000=100, AQM, DEC, average)		1	l	3
387	United Kingdom	United Kingdom - CPI: all items (index number, 2000=100, AQM, DEC, average)		1	l	3
388	United Kingdom	FTSE 100		1	l	3
389	United Kingdom	Other investment assets		1	nl	2
390	United Kingdom	Other investment liab., N.I.E.		1	nl	2
391	United Kingdom	United Kingdom\cyclical indicators\surveys of manufacturing industry:\current level		1	l	3
392	United Kingdom	Cyclical indicators\surveys of manufacturing industry:\composite industrial		0	nl	0
393	United Kingdom	Cyclical indicators\consumer opinion on economic and financial		0	nl	0
394	United Kingdom	Government saving (net), value \ GBP		0	nl	0
395	United Kingdom	Unemployment rate \ percent		0	nl	0
396	United Kingdom	Direct investment abroad		0	nl	0
397	United Kingdom	Dir. invest. in Rep. Econ., N.I.E.		0	nl	0
398	United Kingdom	Portfolio investment assets		0	nl	0
399	United Kingdom	Portfolio investment liab., N.I.E.		0	nl	0
400	United Kingdom	Financial account, N.I.E.		0	nl	0
401	United States	Balance of income, value, balance of payments basis \ U.S. dollar		1	nl	2
402	United States	Current account, value in US\$ \ U.S. dollar		1	nl	2
403	United States	Government consumption of fixed capital, value \ U.S. dollar		1	l	3
404	United States	Private final consumption expenditure, volume \ U.S. dollar		1	l	3
405	United States	Employment, country specific, variable a \ U.S. dollar		1	l	3

APPENDIX I. Macroeconomic Series (concluded)

Number	Country	Variable Name	Unit	Root	Log	Treatment
406	United States	Dependent employment \ U.S. dollar		1	1	3
407	United States	Dependent employment of the business sector \ U.S. dollar		1	1	3
408	United States	Government employment \ U.S. dollar		1	1	3
409	United States	Self-employed \ U.S. dollar		1	1	3
410	United States	Total employment \ U.S. dollar		1	1	3
411	United States	Employment of the business sector \ U.S. dollar		1	1	3
412	United States	Real Effective exchange rate, 2000 = 100, ULC-based		1	1	3
413	United States	Gross domestic product, volume, market prices \ U.S. dollar		1	1	3
414	United States	Private nonresidential fixed capital formation, volume \ U.S. dollar		1	1	3
415	United States	Government fixed capital formation, volume \ U.S. dollar		1	1	3
416	United States	Industrial production \ U.S. dollar		1	1	3
417	United States	Private total fixed capital formation, volume \ U.S. dollar		1	1	3
418	United States	Long-term interest rate on government bonds \ U.S. dollar		1	nl	2
419	United States	Long-term interest rate on corporate bonds \ U.S. dollar		1	nl	2
420	United States	Short-term interest rate \ U.S. dollar		1	nl	2
421	United States	Gross total fixed capital formation, volume \ U.S. dollar		1	1	3
422	United States	Capital stock of the business sector, volume \ U.S. dollar		1	1	3
423	United States	Capital stock, housing, volume \ U.S. dollar		1	1	3
424	United States	Labor force \ U.S. dollar		1	1	3
425	United States	Labor force participation rate \ U.S. dollar		1	nl	2
426	United States	Imports of goods and services, volume, national accounts basis \ U.S. dollar		1	1	3
427	United States	Money supply, narrow definition: base money, M1 or M2 \ U.S. dollar		1	1	3
428	United States	Money supply, broad definition: M2 or M3 \ U.S. dollar		1	1	3
429	United States	Factor income paid abroad, volume, balance of payments basis \ U.S. dollar		1	1	3
430	United States	Labor productivity of the total economy \ U.S. dollar		1	1	3
431	United States	Labor productivity of the business economy \ U.S. dollar		1	1	3
432	United States	Household saving ratio \ U.S. dollar		1	nl	2
433	United States	Current transfers received by households, value \ U.S. dollar		1	1	3
434	United States	Unit labor cost of the total economy \ U.S. dollar		1	1	3
435	United States	Unit labor costs in the business sector \ U.S. dollar		1	1	3
436	United States	Unit labor cost of the manufacturing sector \ U.S. dollar		1	1	3
437	United States	Velocity of money \ U.S. dollar		1	1	3
438	United States	Wages, value \ U.S. dollar		1	1	3
439	United States	Wages of the government sector, value \ U.S. dollar		1	1	3
440	United States	Wage rate of the business sector \ U.S. dollar		1	1	3
441	United States	Compensation rate of government employees \ U.S. dollar		1	1	3
442	United States	Wage rate of the manufacturing sector, hourly earnings \ U.S. dollar		1	1	3
443	United States	Compensation rate of the business sector \ U.S. dollar		1	1	3
444	United States	Compensation of employees, value \ U.S. dollar		1	1	3
445	United States	Exports of goods and services, volume, national accounts basis \ U.S. dollar		1	1	3
446	United States	Factor income from abroad, volume, balance of payments basis \ U.S. dollar		1	1	3
447	United States	Household disposable income, real \ U.S. dollar		1	1	3
448	United States	Property income received by households, value \ U.S. dollar		1	1	3
449	United States	Government current disbursements, value \ U.S. dollar		1	1	3
450	United States	Current disbursements of households, value \ U.S. dollar		1	1	3
451	United States	Government current receipts, value \ U.S. dollar		1	1	3
452	United States	Current receipts of households, value \ U.S. dollar		1	1	3
453	United States	Self-employment income received by households, value \ U.S. dollar		1	1	3
454	United States	Direct investment abroad		1	nl	2
455	United States	Dir. invest. in rep. econ., N.I.E.		1	nl	2
456	United States	Portfolio investment assets		1	nl	2
457	United States	Portfolio investment liab., N.I.E.		1	nl	2
458	United States	Financial account, N.I.E.		1	nl	2
459	United States	Exports prices		1	1	3
460	United States	Imports prices		1	1	3
461	United States	Terms of trade		1	1	3
462	United States	PPI / WPI (index number, 2000=100, AQM, DEC, average)		1	1	3
463	United States	CPI all items city average (index number, 2000=100, AQM, DEC, average)		1	1	3
464	United States	Share prices: industrial (index number, AQM, DEC, average)		1	1	3
465	United States	Cyclical indicators\business climate: consumers confidence\1985 = 100 SA		0	nl	0
466	United States	USA PMI business confidence		0	nl	0
467	United States	Fixed investment in nonresidential construction, volume \ U.S. dollar		0	1	1
468	United States	Private residential fixed capital formation, volume \ U.S. dollar		0	1	1
469	United States	Fixed investment in machinery and equipment, volume \ U.S. dollar		0	1	1
470	United States	Increase in stocks, volume \ U.S. dollar		0	nl	0
471	United States	Government saving(net), value \ U.S. dollar		0	nl	0
472	United States	Household saving, value \ U.S. dollar		0	1	1
473	United States	Unemployment \ U.S. dollar		0	1	1
474	United States	Unemployment rate \ U.S. dollar		0	nl	0
475	United States	Production/rate of capacity utilisat		0	nl	0
476	United States	Other investment assets		0	nl	0
477	United States	Other investment liab., N.I.E.		0	nl	0
478	World	Commodity Food and Beverage Price Index, 1995 = 100, includes Food and		1	1	3
479	World	Crude Oil (petroleum), simple average of three spot prices; Dated Brent, West Texas		1	1	3
480	World	Commodity Metals Price Index, 1995 = 100, includes Copper, Aluminum, Iron Ore,		1	1	3
481	World	Commodity Nonfuel Price Index, 1995 = 100, includes Food and Beverages and		1	1	3
482	World	Commodity Industrial Inputs Price Index, 1995 = 100, includes Agricultural Raw		0	1	1
483	G7 excl. France	Gross domestic product, volume, index number		1	1	3
484	G7 excl. France	Consumer Price Index (SA, 2000=100), index number		1	1	3
485	Euro area excl. France	Gross domestic product, volume, euro		1	1	3
486	Euro area excl. France	Gross domestic product deflator, index number		1	1	3

Nota bene: Integrated of order 0 = 0, 1 = 1, 2 = 2; not integrated of order 1 or 2 = NS; natural log variables = 1; no transformation = nl.
0: no transformation; 1: logarithm; 2: first difference; 3: first difference of logarithm.

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II. ECONOMIC IMPLICATIONS OF REFORMING WELFARE FINANCING²²

Objective: The purpose of this paper is to analyze the economic implications of two alternative welfare financing reforms recently debated in France: a reduction in payroll taxes funded by an increase in consumption taxes and a reduction in payroll taxes funded by a new levy on business value added. The paper presents conceptual issues, reviews the existing literature on the economic effects of alternative tax structures, and provides new evidence on the impact of different forms of taxation on unemployment.

Main results: While theory does not provide clear-cut results, evidence suggests that consumption taxes tend to be less distortionary than other forms of taxation, and that a shift from payroll to consumption taxes can have a favorable impact on employment and GDP. The size of this effect depends on a number of factors, notably on whether agents are compensated for their loss of purchasing power. A new tax on firms' value added, instead, would raise capital taxation, with negative effects on investment, growth, and efficiency.

Policy implications: A shift from employers' contributions to a consumption VAT would enhance efficiency and would be less distortionary than the status quo or a shift to a tax on firms' value added. However, when evaluated against the main objective of the shift, namely job creation, the effectiveness of a shift to consumption taxation appears to be limited, largely because of widespread indexation in the French economy. Hence, the preferable avenue would be to finance the cut in employers' contributions with reductions in expenditure, rather than an increase in other forms of taxation.

A. Introduction

1. **Reducing labor costs has been near the top of France's economic policy agenda since the early 1990s.** Key steps in this direction include the creation in 1990 of the *Contribution Sociale Généralisée* (CSG), a tax falling on all types of income, with all revenues devoted to social security funds, and successive cutbacks in employers' social security contributions for low-paid workers introduced since the early 1990s.²³ Reductions in

²² Prepared by Edda Zoli.

²³ Currently 60 percent of the main social security system (*régime général*) is financed by payroll contributions, 22 percent by the CSG, and the remaining 18 percent by other miscellaneous sources.

income taxes and the introduction of an earned income tax credit (*Prime pour l'emploi*) were further measures designed to make work pay.

2. **Now further budget neutral cuts in employers' social security contributions are being considered.** While several alternatives have been advanced, two main options on how to finance the reduction are being debated, namely a hike in the existing value-added tax (*TVA Sociale*), or the creation of a new tax levied on business value added (*Cotisation sur la Valeur Ajoutée, CVA*).²⁴ The former would imply a shift from labor to consumption taxation, while the latter would result in an increase in profit, and therefore capital, taxation.

3. **The purpose of this paper is to analyze the potential economic implications of these alternative reforms and examine, more generally, the effect of different forms of taxation on employment, efficiency, and growth.** Section B discusses the conceptual issues related to the two alternative welfare financing reforms. It provides the analytical framework; identifies the main parameters affecting the reform outcome in terms of employment; and points out the effects on consumption, prices, capital accumulation, and competitiveness. Section C presents the evidence on the impact of different forms of taxation on unemployment, growth, and efficiency. After reviewing existing econometric and simulation results, an econometric study on a panel of 15 advanced economies during the period 1970-2004 presents new evidence of the effects of the taxation of consumption, labor, and capital on unemployment. Section D draws the conclusions and policy implications.

²⁴ Box 1 illustrates the different financing options and summarizes the results of the report prepared by the working group set up by the government to evaluate the impact of these alternative reforms.

Box 1. Authorities' Working Group View on Welfare Financing Reform

In the attempt to curtail labor costs and stimulate employment, the French government is considering a budget neutral reform involving a cut in employers' contributions. The proposal currently under examination is a 2.1 percent reduction in contributions, for a total fiscal cost of 8.5 billion euros.^{1/}

To finance the cut, the government is looking at different alternatives. The two main options are a hike in the existing value-added tax (*TVA sociale*) or the creation of a new levy on business value added (*Cotisation sur la Valeur Ajoutée, CVA*).^{2/} Additional alternatives include: (i) the adjustment of contributions according to the weight of salaries in firms' value added; (ii) a new tax on firms' turnover net of the wage bill ("*coefficient emploi-activité*"); (iii) the elimination of exemptions currently granted to certain forms of labor remunerations (the so-called "*niches sociales*", e.g., *participations, épargne salariale, and chèque services*); and (iv) a new business tax on all labor remunerations, including the *niches sociales*, and on corporate profits (*Cotisation Patronale Généralisée*).

The report of the group of experts in charge of assessing the impact of the alternative reforms indicates limited gains in terms of employment from both the CVA and the TVA sociale options. According to their simulations, a cut in employers' contributions financed by the *CVA* would create only 28,000 jobs in two years and would have a negative impact on investment (Table 1). In the long run, the effect on employment would be close to zero, while investment and growth would be slightly reduced (Table 2). Financing the cut through an increase in value-added tax (VAT) from 19.6 to 20.8 percent would generate only 23,000 jobs in two years and would reduce consumption. Furthermore, due to social transfer indexation, public expenditure and the deficit would increase. A budget neutral shift from employers' contribution to VAT would have even more limited gains in terms of employment (Table 1). In the long run, the reform would have a slightly negative impact on investment and output (Table 2).

The other financing alternatives are also expected to generate only small employment gains. A reform involving an adjustment of contributions according to the weight of salaries in firms' value added would be difficult to implement because the ratio of wages to value added is highly volatile and only partially correlated with firms' employment decisions. The macroeconomic impact is expected to be similar to that resulting from the *CVA* option. Also, the effects of the *Cotisation patronale généralisée* are likely to be similar to those of the *CVA*. The *coefficient emploi-activité* would have a negative impact on investment and growth in the long term (Table 2).^{3/}

^{1/} A larger decline in employers' contributions, if financed by a nonprogressive tax, would alter the progressivity of the current contribution system and raise the labor cost of workers close to the minimum wage relative to that of more highly paid workers, thus discouraging employment of the low skilled. Such an effect is considered undesirable, given that the unemployment rate of low-skilled workers is particularly high (12.5 percent in 2005).

^{2/} The idea of this value-added contribution is not new. It was originally part of the 1995 Juppé project. A first report (Chadelat Report), issued in 1997, was favorable to the tax, while the Malinvaud Report, published in 1998, was critical of such a measure.

^{3/} The *niches sociales* option has not been simulated by the working group.

Box 1. Authorities' Working Group View on Welfare Financing Reform (concluded)

Table 1. Results of the Working Group's Simulations (short term)

Effect of a cut of employers' contributions by 2.1 percent (percentage changes)

	<i>CVA</i> ^{1/}		<i>TVA Sociale</i>			
	Budget neutral		Nonbudget neutral ^{2/}		Budget neutral	
	After 1 year	After 2 years	After 1 year	After 2 years	After 1 year	After 2 years
GDP	0.0	0.0	-0.1	0.0	-0.2	-0.1
Households' consumption	0.0	0.1	-0.2	-0.1	-0.3	-0.2
Total investment	-0.1	-0.3	-0.1	0.0	-0.2	-0.2
CPI	0.0	0.0	0.7	0.8	1.0	1.1
New jobs (thousands)	17	28	17	23	11	7
Unemployment rate	-0.1	-0.1	-0.1	-0.1	0.0	0.0
Trade balance (percent of GDP)	0.0	0.0	0.1	0.0	0.1	0.0

^{1/} Scenario based on the assumption that capital depreciation is not deductible from the tax base (*CVA brute*).

^{2/} Under this hypothesis, deficit would increase by 0.12 percent of GDP in the first year.

Table 2. Results of the Working Group's Simulations (long term)

Effect of a cut of employers' contributions by 2.1 percent (percentage changes)

	<i>CVA</i> ^{1/}	<i>TVA Sociale</i>	<i>Coefficient Employ-Activité</i>
GDP	-0.1	-0.1	-0.3
Total investment	-0.3	-0.1	-0.9
New jobs (thousands)	0.0	0.0	0.0

^{1/} Scenario based on the assumption that capital depreciation is not deductible from the tax base (*CVA brute*).

B. The Conceptual Framework

Value-added taxation

4. **A value-added tax is imposed on the value that a firm adds to the goods and services purchased from other firms.** Depending on the treatment accorded to capital goods, three main types of value-added tax can be distinguished: (i) the consumption-; (ii) the gross product-; and (iii) the income-type value-added tax. Under a consumption value-added tax, the full value of any capital good purchased from another firm is deductible from the tax base in the year of purchase, which implies that capital goods are exempted from taxation. In a closed economy, and in an open economy imposing value-added taxation according to the destination principle, this tax is equivalent to a retail sales tax, and its base is consumption (Shoup, 1969).²⁵ The VAT used in Europe is of this type. Under the gross product value-added tax, capital goods are not exempted from taxation, and depreciation cannot be deducted from the tax base. The base of this type of value-added tax is the sum of wages, profits and depreciation (Shoup, 1969). Under an income type of value-added tax, like under the gross product value-added tax, capital goods are not exempted from taxation; however, depreciation can be deducted from the tax base. The base of this type of value-added tax is the sum of wages and profits (Shoup, 1969). The tax on firms' value added under consideration in France (*Cotisation sur la valeur ajoutée, CVA*) would be either a gross product value-added tax (*CVA brute*), or an income type of value-added tax (*CVA nette*).

Financing Cuts in Employers' Contributions With a VAT Hike (*TVA Sociale*)

Impact on employment

5. **In terms of employment, the effects of a reform involving a reduction in employers' contributions financed by higher consumption taxes depend on the following factors:** (i) the response of labor supply to higher consumption taxes; (ii) the response of labor demand to lower employers' contributions; (iii) whether labor markets are competitive or unionized; and (iv) whether wages are indexed to consumer prices. As discussed below, theory does not provide clear-cut results; the impact of this type of reform on employment is thus an empirical question.

²⁵ Under the destination principle, consumption taxes are levied where goods are consumed (so that exports are exempt from domestic taxation), whereas under the origin principle, they are levied where goods are produced. The destination system ensures production neutrality, since all firms receive the same producer price from selling in any location, irrespective of their country of residence. Under certain, strong assumptions, however, destination and origin-based taxes are equivalent (Ebrill and others, 2001, pp. 179–182).

6. **A hike in consumption taxes has an ambiguous effect on labor supply.**²⁶ In terms of impact on labor supply decisions, a consumption tax is similar to a labor income tax, as they both create a wedge between real gross wages and real post-tax consumption wages.²⁷ Just as in the case of an increase in a labor income tax, a VAT hike could result either in higher or lower labor supply, depending on the net impact of the income and substitution effects.²⁸ In a one-period model, the sign and the magnitude of the labor supply response to changes in the consumption tax are determined by the elasticity of substitution between consumption and leisure. In a multi-period model, they are affected also by the intertemporal elasticity of substitution of leisure, as well as consumption, across different periods, and on whether such changes are perceived as temporary or permanent (Auerbach and Kotlikoff, 1987; and Lucas and Rapping, 1969). Given that these parameters may vary across groups of individuals, countries, and periods, the response of labor supply to changes in consumption taxes remains an empirical matter.

7. **In the absence of wage indexation, a cut in employers' contributions raises labor demand.** Consider a firm endowed with the following technology: $Y = f(k, l)$, with $f_l > 0$ and $f_{ll} < 0$, where l is labor and k is capital (for the time being assumed to be constant). The firm pays $w(1+\theta)$ for each unit of labor, where w is the wage rate and θ is the employer's contribution.²⁹ A profit-maximizing competitive firm hires labor up to the point where the marginal productivity of labor equals its marginal labor cost. The first order condition $f_l = w(1+\theta)$ yields the labor demand function $l^d = l(w, \theta)$. After differentiating, it is easy to see that with $dl^d/d\theta = w/f_{ll} < 0$. Hence, a decrease in employers' contribution shifts the labor demand curve outwards.

8. **In a perfectly competitive labor market without wage indexation, the employment effect of a revenue neutral cut in employers' contributions financed by higher consumption taxes is ambiguous.** The impact of such a reform depends mainly on the response of labor supply to the change in consumption taxes. Given that labor demand

²⁶ For a formal derivation of this result, see Appendix I.

²⁷ Under certain circumstances (e.g., in the absence of any form of unearned income, such as inheritance, or when inheritance is taxed at the same rate as labor income), the two taxes are equivalent (Atkinson and Stiglitz, 1980, p. 70).

²⁸ For a discussion of the impact of a change in labor income tax on labor supply, see Atkinson and Stiglitz, 1980, p. 34.

²⁹ The producer output price is normalized to be equal to 1.

increases in response to lower labor costs, employment would certainly rise if labor supply also increased. If, however, labor supply declined, the final effect on employment would depend on the relative size of the shifts in the labor demand and supply curves.³⁰

9. **In an economy with full wage indexation, the same reform is likely to have a positive, but small, impact on employment.**³¹ With full indexation, the price increase caused by higher consumption taxes results in an equal raise in nominal wages. Thus, workers' net real wages do not change, and labor supply remains unaffected. The labor demand response, on the other hand, depends on two factors: while the cut in employers' contributions stimulates labor demand, the increase in nominal wages (which translates into higher real wages for the firm, given that producer prices do not change) discourages it. Given that the VAT tax base (consumption) is larger than employers' contribution base (the wage bill), a given cut in contributions could be financed by a relatively smaller hike in the VAT rate. So, the increase in nominal wages due to indexation is likely to be smaller than the reduction in contributions and, overall, labor costs are likely to decline somewhat, thus marginally stimulating labor demand and employment.

10. **In a labor market where wages and employment are determined by the bargaining between trade unions and employers, a cut in employers' contributions financed by higher consumption taxes has a positive impact on employment.** Consider the so-called "right-to-manage" model, where firms and unions bargain over wages, and employment is then freely chosen by the firm so as to maximize profits. As shown in Appendix I, in this setting higher consumption taxes are not translated into higher wages. Given that labor demand increases as a result of lower employers' contributions, while wages remain unchanged, the reform has a positive effect on employment. This result, however, is based on the assumption that union membership is given, and so labor supply by union members is perfectly elastic. The outcome could be different if, instead, union membership and therefore labor supply, were endogenous.

Other issues arising from the proposed reform

11. **Switching from employers' contributions to consumption taxes implies broadening the tax base from labor income to consumption.** Since the consumption tax

³⁰ See Figures 1a and 1b in Appendix I.

³¹ This case is relevant for France, given that salaries are to some extent indexed. In fact, the minimum wage (SMIC) is formally indexed to the CPI, and changes in the SMIC, in turn, influence other salaries adjustments (DARES, 2006).

base is fairly large, a revenue-neutral reduction in contributions could be financed by a relatively small increase in the VAT rate. Given that efficiency losses from distortionary taxation increase more than proportionally with the tax rate, such a shift should reduce the dead-weight loss.³² Furthermore, as the consumption tax base includes those who consume out of capital and transfer incomes (e.g., pensions, social benefits) as well as wage income, the overall tax burden on labor could be reduced, even in conditions when the increased taxation on consumption results in an equivalent increase in nominal wages. If, however, transfer incomes were indexed to the increase in consumer prices resulting from the VAT hike, public expenditure would rise, and, presumably, a budget-neutral shift from payroll to consumption taxes would allow a relatively small cut in employers' contributions. In this case, labor would continue to largely bear the incidence of taxation.³³

12. The cut in employers' contributions accompanied by an increase in VAT could have an impact on trade. A VAT is often viewed as an aid to international competitiveness, as it is levied on imports, but rebated on exports. If VAT is raised to lower employers' contributions, domestic producers are expected to gain competitiveness, as, in principle, they could cut their sales prices by the amount of the cost relief. Hence, exporters could benefit from such a move, which would be equivalent to a real exchange rate depreciation. This conclusion, however, is questionable. As discussed above, with wage indexation, the VAT increase, and the accompanying rise in consumer prices, would lead to higher nominal wages, thus somewhat offsetting the decline in labor costs resulting from lower social contributions. Secondly, the argument that VAT taxation favors export performance is considered incorrect by theorists and has not received empirical support.³⁴

13. A VAT increase is likely to unfavorably impact consumption and inflation. The VAT rise would also translate into an increase in prices, whose magnitude would depend on firms' ability to pass the VAT forward. Whether or not forward-shifting would be inflationary, as opposed to a once-and-for-all change in the level of prices, would depend on

³² It is known from the optimal tax literature that the excess burden increases with the square of the tax rate (Auerbach, 1985).

³³ This consideration is particularly relevant for France, where pensions and a wide range of family benefits are indexed to the Consumer Price Index (CPI).

³⁴ According to Krugman and Feldstein (1989); and Auerbach (1997), this argument is incorrect except in the very short run, because exchange rates or domestic prices adjust to offset the effect of the VAT tax on the relative prices of domestic and foreign goods. Once prices or exchange rates have adjusted, the valued-added tax will have no effect on imports and exports. From an empirical point of view, recent studies by Desai and Hines (2005) and Keen and Syed (2006) find no evidence of a positive impact of VAT taxation on trade performance.

a number of factors, including the reaction of wages, the monetary policy stance, and psychological effects (Tanzi, 1983; Tait, 1988). Due to agents' purchasing power loss, domestic consumption would probably decline in response to a VAT hike, although, shortly before the introduction of the reform, it may increase in anticipation of a higher tax rate.

14. **The expected impact of the VAT hike on investment is ambiguous, but it is likely to be small.** On one hand, given that capital goods are exempted from VAT taxation, an increase in the latter should not significantly affect investment decisions. On the other hand, since the reform would shift part of the tax burden to the recipients of capital income, investment may decline. The empirical evidence, however, suggests that the consumption taxation base generates more long-run capital formation than wage taxation (Auerbach and Kotlikoff, 1987).

Financing Cuts in Employers' Contributions with a Tax on Firms' Valued Added (*CVA*)

15. **The effect of a reduction in employers' contributions financed by a new levy on firms' value added hinges crucially on its impact on labor and capital costs.** This depends on how the tax base is defined. One important aspect is whether capital amortization, interest payments, and employers' contributions would be deductible from the tax base. Additional aspects to be considered in assessing the reform are the long-term implications in terms of capital accumulation and firms' location decisions, the impact on different sectors of the economy, and the effects on international trade.³⁵

16. **The reform would imply a reduction in labor taxation and an increase in profit, and therefore capital, taxation.** As the new tax on firms' value added would be either a gross product (*CVA brute*), or an income type of value-added tax (*CVA nette*), its base would be the sum of wages, profits, and depreciation in the former case, or the sum of wages and profits in the latter case. In any event, the reform would broaden the tax base for employers' contributions from wages to wages and profits. Labor would continue to bear part of the taxation burden.

17. **With capital virtually fixed in the short run, the change in tax structure would only impact firms' labor demand, though in the medium to long term, it would affect both labor and capital utilization.** To analyze the firm's problem, suppose that the price of

³⁵ Another issue is the compatibility of a new tax on firms' value added with EU law. The General Counselor of the European Court of Justice has recently indicated that a similar tax in effect in Italy (the IRAP) is not compatible with the VI directive on the harmonization of the laws of the member states relating to turnover taxes. The Court of Justice has still to make a final pronouncement on the matter.

capital is p , firms borrow at the rate r to finance investment, and capital depreciates at rate δ . Assume that social security contributions and interest payments are deductible from the tax base and that the tax deduction for depreciation is $a\delta$, where a can be greater, smaller, or equal to 1.³⁶ The output price is normalized to be equal to 1. Inputs are chosen in order to maximize the following net profit function:³⁷

$$\Pi^N = (1 - t_{VA})f(k, l) - wl(1 + \theta) - rpk - \delta pk + t_{VA}wl\theta + t_{VA}rpk + t_{VA}a\delta pk$$

where t_{VA} is the tax rate on the firm value added. If social security contributions are not deductible, the term $t_{VA}wl\theta$ is equal to zero; if interest payments are not deductible, the term $t_{VA}rpk$ is equal to zero; if amortization is not deductible, the term $t_{VA}a\delta pk$ is equal to zero.

18. In the short run, employment would increase as a result of the reduction in labor taxation. However, the size of this increase would depend on the cut in employers' contributions, on the tax rate t_{VA} , and on whether remaining contributions would be deductible from the tax base. Maximization of the net profit function with respect to l , while keeping capital constant, yields the following first order condition:

$$f_l = [w(1 + \theta) - t_{VA}w\theta]/(1 - t_{VA})$$

If employers' contributions are not deductible from the value-added tax base, the term $t_{VA}w\theta$ in square brackets is zero, and so the marginal cost of labor (the term on the right hand side of the above equation), is higher.

19. Firms' capital accumulation depends on the tax rate t_{VA} , and on the deductibility of interest and amortization from the tax base. In the medium to long term, firms choose an amount of capital satisfying the following first order condition:

$$f_k = [\delta p + rp - t_{VA}rp - t_{VA}a\delta p]/(1 - t_{VA})$$

If amortization is not deductible, the term $t_{VA}a\delta p$ is equal to zero; if interest payments are not deductible, the term $t_{VA}rp$ is equal to zero. In both cases, the marginal cost of capital (the term on the right hand side of the above equation) is higher.

³⁶ If $a=1$, it means that fiscal depreciation is equal to true economic depreciation, while $a > 1$ implies accelerated depreciation.

³⁷ This is based on the assumption that capital can be adjusted to a new desired level at no cost.

20. **Given that a tax on businesses' value added is a form of capital taxation, in the long run, it could discourage investment and give firms an incentive to relocate abroad.** Both theoretical models and empirical research indicate that investment demand is sensitive to capital taxation.³⁸ Since capital is fairly mobile in the medium to long term, the tax on businesses' value added could result in firms relocating abroad, with a negative impact on employment. This negative effect of the reform probably would not be uniform across all sectors of the economy, as high value-added and capital intensive industries would likely be more penalized than the labor-intensive ones.³⁹

21. **A tax on businesses' value added could also have an impact on trade.** Unlike the consumption type VAT tax, this form of taxation follows the origin principle, since it is levied in the country where goods are produced and could, in principle, be less favorable to competitiveness. From a macroeconomic point of view, however, the scant available empirical evidence indicates that origin-based corporate taxation has an initial positive effect on net exports and virtually no effect in the long run (Keen and Syed, 2006).⁴⁰ From a microeconomic point of view, the effect of the reform on firm competitiveness is likely to vary across the different sectors of the economy.

C. Evidence

Review of the literature

22. **The empirical literature based on regression analysis typically assumes that what affects unemployment is the total tax rate, including labor and consumption taxes, and not the individual components.** According to this view, income taxes, employers' and employees' contributions, as well as consumption taxes are considered substitutes and are expected to have no differential impact on labor cost and employment. Hence, most

³⁸ For a comprehensive and recent survey of the empirical evidence on the effects of taxation on investment, see Hasset and Hubbard (2002).

³⁹ The tax on firms' value added could also affect corporate financial decisions, depending on whether debt financing is favored relative to equity financing. This issue, however, is probably less relevant from a macroeconomic perspective.

⁴⁰ Keen and Syed (2006) argue that net exports increase in the short run because a source-based corporate income tax reduces domestic investment, leading to a decline in imports (or a rise in exports) of capital goods.

econometric studies use a measure of the tax wedge combining labor and consumption taxes, without investigating the impact of alternative forms of taxation on unemployment.⁴¹

23. **Contrary to this widely held view, Daveri and Tabellini (2000) argue that only direct labor taxation (i.e., income tax and social security contributions) matter for unemployment.** According to them, only labor taxes drive a wedge between income if employed and unemployed, while consumption taxes hit both employed and unemployed in the same way. Thus, a shift of taxation from labor to consumption would help in reducing unemployment. Additionally, according to Daveri and Tabellini's model, an increase in capital taxation would not have any impact on unemployment, but a negative effect on the steady state capital stock and per capita income. These propositions are confirmed by their econometric study on a panel of 14 industrial countries over the period 1965–95.⁴²

24. **Simulation studies typically conclude that a shift from labor to consumption taxation could be beneficial to employment and growth, but the size of these gains varies across studies (Table 1).** According to some simulations based on the EU Commission services' QUEST II model, in the long run, a reduction of labor taxes by 1 percent of GDP coupled with an increase in consumption taxes of compensating size, would have a positive, nontrivial, effect on employment and GDP. A shift from labor to corporate taxation, instead, would raise employment but reduce GDP (Leibfritz and others, 1997). Other, more recent, simulations with a similar model indicate that the size of the positive impact of a shift from labor to consumption taxation would depend on whether agents are compensated for their purchasing power loss (European Commission, 2000). An experiment conducted by the Belgian Federal Planning Bureau (*Bureau Fédéral du Plan*, 2006) for the euro area finds limited employment and growth effects of a reduction in social contributions, accompanied by a matching rise in indirect taxes.

25. **A number of papers have investigated, more generally, the impact of alternative forms of taxation on growth and efficiency.**⁴³ Simulations of neoclassical growth models indicate that consumption taxes are more efficient than labor taxes, which, in turn, are more

⁴¹ The empirical literature on taxation and unemployment is large. For a recent surveys, see Arpaia and Mourre (2005) and Nickell (2004).

⁴² Daveri and Tabellini (2000) estimate the impact of labor and consumption taxation in three groups of countries characterized by different trade union systems. They find that labor taxation is harmful to employment especially in countries with strong but decentralized trade unions, while consumption taxes do not affect employment, irrespective of the trade union system.

⁴³ For a survey see Baylor (2005).

efficient than capital taxes (Ballard, Shoven, and Whalley, 1985; Auerbach and Kotlikoff, 1987; Judd, 1987; Matier and Wu, 2000; and Baylor and Beauséjour, 2004).⁴⁴ This result appears to be confirmed when different tax policies are ranked according to their impact on steady-state output rather than on their efficiency. Results from the endogenous growth literature suggest that tax structure does not affect long-run growth, but it has permanent level effects fairly consistent with the findings obtained by the neoclassical growth literature, although the evidence varies somewhat across countries (Lucas, 1990; Devereux and Love, 1994; Mérette, 1997; Xu, 1997).⁴⁵

Table 1. Summary of Simulation Results

(Percentage points deviation from baseline)

Leibfritz and Others (1997)	European Commission (2000)	Belgian Federal Planning Bureau (2006)
Long-run effect of a cut in labor taxes by 1 percent of GDP financed by an increase in consumption taxes		Effect of a cut in social security contributions equal to 1 percent of the euro area GDP, financed by an increase in indirect taxes 1/
GDP	EU Average GDP	Euro Area GDP
EU	0.64 Without compensating transfer recipients 2/	0.66 0.19
France	0.80 Compensating transfer Recipients 3/	0.37
Employment	EU Average Employment	Euro Area Employment
EU	0.57 Without compensating transfer recipients 2/	0.82 0.13
France	0.73 Compensating transfer Recipients 3/	0.48

1/ Medium-term effect (six years after reform).

2/ Assuming that unemployed and other transfers recipients are not compensated for the increase in consumer prices.

3/ Assuming that unemployed and other transfers recipients are compensated for the increase in consumer prices.

Empirical analysis

26. **This section provides new evidence on the impact of different forms of taxation on unemployment.** The analysis differs from most of the existing econometric literature,

⁴⁴ In this context, efficiency is measured either by the welfare losses arising from a tax or by a marginal excess-burden type concept.

⁴⁵ Another strand of the endogenous growth literature finds that tax policy can have nontrivial growth effects in the long run (for instance, King and Rebelo, 1990). Unfortunately, to our knowledge, there are no works examining tax ranking in such a context.

which typically includes among the explanatory variables for unemployment a measure of the tax wedge combining labor and consumption tax, by disentangling the impact of these two types of taxes and assessing the effect of capital taxes on unemployment. The econometric analysis is conducted on a panel of 15 advanced economies⁴⁶ over the period 1970–2004, thus extending the sample period covered in the existing literature, which typically ends in the mid- to the late 1990s.

27. The dependent variable in the regressions is either the unemployment rate, as defined by the OECD, or the employment rate of the business sector. The main explanatory variables are the average effective tax rates⁴⁷ on labor, consumption, and capital.⁴⁸ These are calculated as the ratios between the tax revenues from particular taxes and the corresponding tax bases, using data from the AMECO database, combined with auxiliary information from the OECD databank *'Revenue Statistics,'* following a method similar to that proposed by Mendoza, Razin, and Tesar (1994).⁴⁹

28. The control variable set includes the output gap and several indicators of labor market institutions that have been typically used in the literature. These comprise the employment protection index, a measure of unemployment benefit entitlements, and measures of the strength of trade unions (centralization, coordination, trade union density, collective bargaining coverage).⁵⁰ As these indicators tend to be correlated, they are summarized by their first principal component.⁵¹ Given that recent research has shown that

⁴⁶ The sample countries are: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Portugal, Spain, Sweden, United Kingdom, and United States.

⁴⁷ It would be preferable to use marginal, rather than average, effective tax rates, as the former are more likely to affect agents' decisions. However, long time series on marginal effective tax rate are not available.

⁴⁸ The effective tax rates on labor comprise effective rates on labor income tax as well as employees' and employers' contributions.

⁴⁹ These data are regularly constructed for the European Commission Spring and Autumn forecasts and were kindly provided by Carlos Martinez-Mongay. For details and methodological issues, see Martinez-Mongay (2000 and 2003).

⁵⁰ Variables definitions and data sources are reported in Appendix II.

⁵¹ When individual institutional variables, rather than their principal components, are entered in the regressions, the general estimation results are not affected, but the size and significance of the individual labor market indicators are not very robust to alternative model specifications.

unemployment may be affected by the degree of product market competition, the OECD index of product market regulation is also included in some regressions.⁵²

29. **The estimation results indicate that labor taxes contribute to higher unemployment or lower business sector employment rates, while consumption and capital taxation do not have a significant effect (Table 2).** Indeed, the variable measuring effective labor taxation (LABOR TAX) exhibits a positive and significant coefficient on the unemployment rate and a significantly negative coefficient on the business employment rate, whereas the coefficients of the variables accounting for consumption and capital taxation (CONSUMPTION TAX and CAPITAL TAX, respectively) are not statistically significant.

30. **This result is robust to alternative model specification and estimating procedures.** The basic model specifications (Equations (1) and (2)) are estimated using OLS and include both country and time effects. Since rising unemployment rates could have forced countries to increase taxes to pay for higher unemployment benefits, Equation (3) is estimated by two-stage least squares, using lagged values of the taxation variables as instruments, to address the possible endogeneity of the right-hand side variables. In Equation (4), lags of the variable measuring capital taxation are included in the model to account for possible delays in the response of unemployment to capital taxation. Given that unemployment and labor taxes have risen at the same time in some countries, in Equation (5), the model is estimated in first differences to cope with the possible problem of spurious correlation.⁵³ In Equation (6), the dependent variable is the employment rate of the business sector. Consistent with the results discussed above, the estimates indicate that labor taxes have a negative and significant impact on employment, while consumption and capital taxes do not have significant effects.

⁵² See, for example, Blanchard and Giavazzi (2003) and Nicoletti and Scarpetta (2005) and the references therein.

⁵³ Panel unit root tests indicate that all the variables are stationary.

Table 2. Regression Results

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Unemployment Rate					Employment Business Sector
Estimating method	OLS	OLS	Two-Stage Least Squares	OLS	OLS (Difference)	Two-Stage Least Squares
OUTPUTGAP	-0.51 (5.41***)	-0.47 (5.63***)	-0.50 (5.88***)	-0.53 (5.51***)	-0.37 (14.6***)	0.58 (5.46***)
CONS. TAX	-0.13 (1.92*)	-0.09 (1.40)	-0.15 (1.61)	-0.12 (1.77)	-0.02 (0.80)	0.07 (0.36)
LABOR TAX	0.17 (1.93**)	0.27 (2.43**)	0.24 (2.34**)	0.18 (2.03**)	0.07 (1.98**)	-0.55 (3.09***)
CAPITAL TAX	0.11 (1.62)		0.10 (1.52)	-0.04 (1.11)	-0.03 (1.00)	0.05 (0.33)
CAPITAL TAX(-1)				-0.03 (-1.11)		
CAPITAL TAX(-2)				0.03 (0.50)		
PRINC. COMP. ²	0.06 (2.43**)	0.06 (2.31**)	0.06 (2.54**)	0.07 (2.70**)	0.06 (2.54**)	-0.11 (1.01)
REGULATION		-0.38 (0.63)			0.23 (1.23)	
Time effects	Yes	Yes	Yes	Yes	No	Yes
Country Effects	Yes	Yes	Yes	Yes	No	Yes
Adjusted R ²	0.82	0.83	0.83	0.83	0.40	0.91
No. Observations	461	420	456	448	405	323
No. Countries	15	15	15	15	15	10

Source: IMF staff estimates.

¹ In parenthesis, absolute value of t-statistics. The Breusch-Godfrey LM test detects serial correlations for all the regressions estimated in levels. Therefore, in Equations (1) through (4) and (6), t-statistics are obtained using White period standard errors that are robust to arbitrary serial correlation. *, **, and *** indicate that the coefficient is significant at the 10, 5, and 1 percent levels, respectively.

² Principal component summarizing the following variables: employment protection index; unemployment benefit entitlements; measures of strength of trade unions (centralization, coordination, and trade union density).

D. Conclusions and Policy Implications

31. This paper analyzes the economic implications of two alternative tax reforms under consideration in France, taking into account, more generally, the effects of different forms of taxation on employment, efficiency, and growth. The main results are as follows:

A reduction in employers' contribution financed by higher consumption taxes (the *TVA sociale* hypothesis) is subject to the following considerations:

- From a theoretical viewpoint, the impact of such a reform on employment is ambiguous and depends on (i) the response of labor supply to higher consumption taxes; (ii) the response of labor demand to lower employers' contributions; (iii) whether labor markets are competitive or unionized; and (iv) whether wages are indexed to consumer prices.
- The broadening of the social contribution tax base from labor income to consumption would yield efficiency gains. However, if transfer incomes were indexed, the VAT hike would raise public expenditure. Hence, a budget-neutral shift from payroll to consumption taxes would create scope for only a relatively small cut in employers' contributions and would only marginally alleviate the taxation burden on labor.
- Unfavorable effects from the reform could include a negative impact on consumption and an increase in prices. The expected effect on investment is ambiguous and likely to be small. Effects on export performance are debatable.
- New empirical results presented here confirm that labor taxes have an adverse effect on unemployment or on business sector employment. However, compared to the empirical literature, which lumps labor and consumption taxes together, the estimates do not find significant effects of consumption taxes on unemployment.
- The literature suggests that consumption taxes are less distortionary than labor and capital taxation.
- Existing simulations consistently indicate that a shift from labor to consumption taxation could be beneficial to employment and growth, but the size of these gains varies across studies, notably depending on whether agents are compensated for their purchasing power loss.

A reduction in employers' contribution financed by a new tax on businesses' value added (the *CVA* option) is subject to the following considerations:

- In the short run, employment would rise as a result of the reduction in labor taxation. However, the size of this increase would depend on the cut in employers' contributions, on the firms' value-added tax rate, and on whether remaining contributions would be deductible from the tax base. In any event, labor would continue to bear part of the incidence of taxation.
- As this tax on value added is a form of capital taxation, in the long run, it would discourage capital accumulation and give firms an incentive to relocate abroad, especially for companies operating in high value-added and capital-intensive industries.
- Several studies find that capital taxation is the most distortionary form of taxation and has a harmful impact on investment and growth.
- The overall impact on investment would depend on whether amortization and interest payments would be deductible from the tax base.

32. **The considerations above suggest the following policy implications:**

- A reform involving a cut in employers' contributions financed by the *CVA* would not be very beneficial, as the positive impact on employment would be offset by the detrimental effects on investment, growth, and efficiency.
- A budget-neutral cut in employers' contributions financed by a VAT hike would enhance efficiency with respect to the status quo and would be less distortionary than introducing the *CVA*. However, the impact of such a reform on job creation may be limited, largely because of the widespread indexation in the French economy. In fact, on one hand, social transfers indexation would raise public expenditure, thus creating scope for only a small reduction in contributions. On the other hand, the wage indexation system would offset the labor cost decline resulting from the cut in contributions, thus limiting labor demand expansion.
- Given these considerations and the fact that the tax burden in France is already high, the preferable avenue is to finance the cut in employers' contributions with reductions in expenditure rather than an increase in other forms of taxation.

**APPENDIX I. FINANCING EMPLOYERS' CONTRIBUTIONS CUTS THROUGH
HIGHER CONSUMPTION TAXES**

Impact of higher consumption taxes on labor supply

A hike in consumption taxes would have an ambiguous effect on labor supply. Consider a consumer whose utility function is

$$U(c, f) \tag{1}$$

where c is the composite consumption good, $f=1-l$ is leisure, l is working time, and the maximum number of hours is equal to 1. The consumer's budget constraint is

$$(1+t)c = wl + z \tag{2}$$

where t is the consumption tax, w is the nominal wages, z is unearned income (e.g., inheritance, accumulated wealth), and the consumption price is normalized to be equal to 1. It is easy to see that when $z=0$, a consumption tax is equivalent to a labor income tax.⁵⁴ Maximization of (1) subject to the budget constraint (2) yields the first order condition

$$U_f / U_c = w/(1+t). \tag{3}$$

Substituting $c = (wl + z)/(1+t)$ from the budget constraint into (3) and totally differentiating with respect to t and f , one obtains the response of labor supply to changes in the consumption tax:

$$\frac{dl}{dt} = -\frac{df}{dt} = \frac{\frac{\partial U_c}{\partial t} w - \frac{\partial U_f}{\partial t} (1+t) - U_f}{\frac{\partial U_c}{\partial f} w - (1+t)U_{ff}}, \tag{4}$$

which has an ambiguous sign.

⁵⁴ With a consumption tax, when $z=0$, the budget constraint (2) becomes $(1+t)c = wl$. With a labor income tax t_w , the consumer's budget constraint is $c = w(1-t_w)l$. The two budget constraints are identical if $1-t_w = 1/(1+t)$.

In a one period model, the sign and the magnitude of the labor supply response to changes in the consumption tax depend on the elasticity of substitution between consumption and leisure. Consider the case of the CES utility function, which has been largely used in the labor economics literature (e.g., Auerbach and Kotlikoff, 1987); and Pissarides, 1998) and which takes the following form:

$$U = \left[\beta c^{(\gamma-1)/\gamma} + (1-\beta) f^{(\gamma-1)/\gamma} \right]^{\gamma/(\gamma-1)} \quad (5)$$

where γ is the elasticity of substitution between consumption and leisure and β represents the intensity of household preferences for consumption relative to leisure. Inspection of the labor supply function obtained maximizing (5) subject to the budget constraint (2) indicates that the parameter γ plays a very important role in determining the response of labor supply to changes in taxation.⁵⁵ When $z=0$, if $\gamma=1$, the income and substitution effects on labor supply exactly offset each other, and the labor supply curve is inelastic to the changes in wages and consumption taxes. When $\gamma>1$, the labor supply curve is upward-sloping, and an increase in the consumption tax (which is equivalent to a decrease in net wages) yields a reduction in labor supply. When instead $\gamma<1$, the labor supply curve has a negative slope, and an increase in consumption tax yields an increase in labor supply.⁵⁶

Impact of lower employers' contributions on labor demand

In the absence of wage indexation, a cut in employers' contribution raises labor demand. Consider a firm endowed with the following technology:

$$Y = f(k, l) \quad (6)$$

The production function is increasing and strictly concave in labor (l). Capital (k) is assumed to be constant. The firm pays $w(l+\theta)$ for each unit of labor, where w is the wage rate, and θ

⁵⁵ The labor supply function is

$$l^s = \left[\left(\frac{w}{1+t} \right)^\gamma \left(\frac{\beta}{1-\beta} \right)^\gamma (1+t) - z \right] / \left[w + \left(\frac{w}{1+t} \right)^\gamma \left(\frac{\beta}{1-\beta} \right)^\gamma (1+t) \right]$$

⁵⁶ When z is positive and $\gamma<1$, the labor supply curve is initially upward-sloping but becomes backward-bending for higher wage levels. An increase in consumption taxes yields an increase in labor supply.

is the employer's contributions. Price is normalized to be equal to 1. The first-order condition is:

$$f_l = w(1 + \theta) \quad (7)$$

which yields the downward-sloping labor demand function

$$l^d = l'(w, \theta) \quad (8)$$

Totally differentiating (7), it is easy to see that $dl^d/d\theta = w/f_{ll} < 0$. (9)

An increase in employers' contributions shifts the labor demand curve inwards, and the shift is bigger the larger the wage rate is.⁵⁷

Effects of the reform on employment in a competitive labor market

In competitive markets and in the absence of wage indexation, the effect on employment of a revenue-neutral cut in employers' contributions financed by an increase in consumption tax is ambiguous. In response to lower labor costs, the labor demand function would shift outwards. If labor supply also rises after the increase in consumption taxes, the labor supply curve would also shift outwards, and employment would certainly increase (Figure 1a). If, however, labor supply declines and the curve shifts inwards, the final effect on employment would depend on the relative size of the shift in the labor demand and supply curves (Figure 1b).

Effects of the reform on employment in a unionized labor market

Consider a labor market where wages and employment are determined by the bargaining process between trade unions and employers. In this so-called "right to manage" model, the firms and the union bargain over wages, and then employment is freely chosen by the firm so as to maximize profits. Following the standard assumption in the labor economics literature (e.g., Booth, 1995 and Atkinson, 1999), the outcome of this process is the generalized Nash bargaining solution. According to this approach, wages are determined by the maximization of the product of each agent's net gains from reaching a bargain, weighted by their respective bargaining strengths. For the firm, the net gain from reaching an

⁵⁷ This result holds also when capital is flexible.

agreement is simply its profit function.⁵⁸ For the union, it can be shown that the net gain from bargaining is

$$l[V(w)-V(b)] \quad (10)$$

where V is a utility function such that $V' > 0$, $V'' < 0$, l is union member employment, w is real gross wage, and b is the real gross reservation wage, or the real gross unemployment benefit.⁵⁹ With consumption taxes, employers and unions choose real gross wages in order to maximize

$$\Pi^\varphi \times \left\{ l \times \left[V\left(\frac{w}{1+t}\right) - V\left(\frac{b}{1+t}\right) \right] \right\}^{1-\varphi} \quad (11)$$

where Π is the firm's profit and φ is a positive number measuring the employer's bargaining power. When $\varphi = 0$, the outcome is the monopoly union model. With a Cobb-Douglas production function of the form $Y = k^\alpha l^{(1-\alpha)}$, the first-order condition for the maximization problem above reduces to

$$G(w) \equiv \varphi \frac{1-\alpha}{\alpha} + \frac{(1-\varphi)}{\alpha} - (1-\varphi)w \frac{\partial \left[V\left(\frac{w}{1+t}\right) - V\left(\frac{b}{1+t}\right) \right] / \partial w}{\left[V\left(\frac{w}{1+t}\right) - V\left(\frac{b}{1+t}\right) \right]} = 0. \quad (12)$$

Equation (12) defines implicitly the gross real wage agreed upon by the union and the firm as a function of the other parameters of the model. Once wages have been determined by the bargaining process, the firm chooses the number of workers depending on its labor demand function.⁶⁰

In this setting, an increase in consumption taxes has no impact on gross real wages. This can be seen by specifying an explicit functional form for V . Consider, for example, the following constant relative risk aversion function, which has been largely utilized in the labor market literature:⁶¹

⁵⁸ It is assumed that in the case that the firm does not reach a bargain with the unionized workforce, it cannot obtain any worker, and its profits are zero.

⁵⁹ See Booth (1995), p. 125.

⁶⁰ A graphical illustration of the model outcome is presented in Figure 2a.

⁶¹ See, for instance, Booth (1995); Farber (1978); and Pissarides (1998).

$$\begin{aligned}
V\left(\frac{w}{1+t}\right) &= \frac{1}{1-\sigma} \left(\frac{w}{1+t}\right)^{1-\sigma} \\
V\left(\frac{b}{1+t}\right) &= \frac{1}{1-\sigma} \left(\frac{b}{1+t}\right)^{1-\sigma}
\end{aligned} \tag{13}$$

where σ measures relative risk aversion. If $\sigma=0$, the trade union is risk-neutral, and the utility function is linear in wages. In this case, it is evident that the tax rate t disappears from the last term in (12), and the gross real wages is set irrespectively of the tax rate. In other words, any change in the tax rate does not have any impact on gross real wages. If σ is positive, to evaluate the impact of changes in t on w , totally differentiate Equation (12) with respect to t and w .

$$\frac{dw}{dt} = -\frac{\partial G/\partial t}{\partial G/\partial w}$$

and, with the utility function (13),

$$\begin{aligned}
\frac{\partial G}{\partial t} &= \frac{(1-\varphi)w\left(\frac{w}{1+t}\right)^{-\sigma} \left(\frac{b\left(\frac{b}{1+t}\right)^{-\sigma}}{(1+t)^2} - \frac{w\left(\frac{w}{1+t}\right)^{-\sigma}}{(1+t)^2} \right)}{(1+t) \left(-\frac{\left(\frac{b}{1+t}\right)^{1-\sigma}}{1+\sigma} + \frac{\left(\frac{w}{1+t}\right)^{1-\sigma}}{1-\sigma} \right)^2} + \frac{(1-\varphi)w\left(\frac{w}{1+t}\right)^{-\sigma}}{(1+t)^2 \left(-\frac{\left(\frac{b}{1+t}\right)^{1-\sigma}}{1+\sigma} + \frac{\left(\frac{w}{1+t}\right)^{1-\sigma}}{1-\sigma} \right)} \\
&\quad - \frac{(1-\varphi)w^2\sigma\left(\frac{w}{1+t}\right)^{-1-\sigma}}{(1+t)^3 \left(-\frac{\left(\frac{b}{1+t}\right)^{1-\sigma}}{1+\sigma} + \frac{\left(\frac{w}{1+t}\right)^{1-\sigma}}{1-\sigma} \right)} = 0
\end{aligned}$$

Also, in the case of a risk-averse trade union, any change in the tax rate does not have any impact on gross real wages. The rationale for this result is the following: In this model, wage determination depends on the difference between real income when employed and when unemployed. Consumption taxes do not affect wages, as they do not create a wedge between real income when employed and when not employed.

As higher consumption taxes are not translated into higher gross real wage, and labor demand increases as a result of lower employers' contributions, the reform has a positive effect on employment. The parameter θ does not enter into the wage Equation (12)

but only in the labor demand function, which implies that a decrease in employers' contributions would stimulate labor demand without affecting wages. Therefore, the labor demand curve would shift to the right, while the equilibrium wage remains unchanged. The final outcome would be an increase in employment (Figure 2b).

Figure 1a

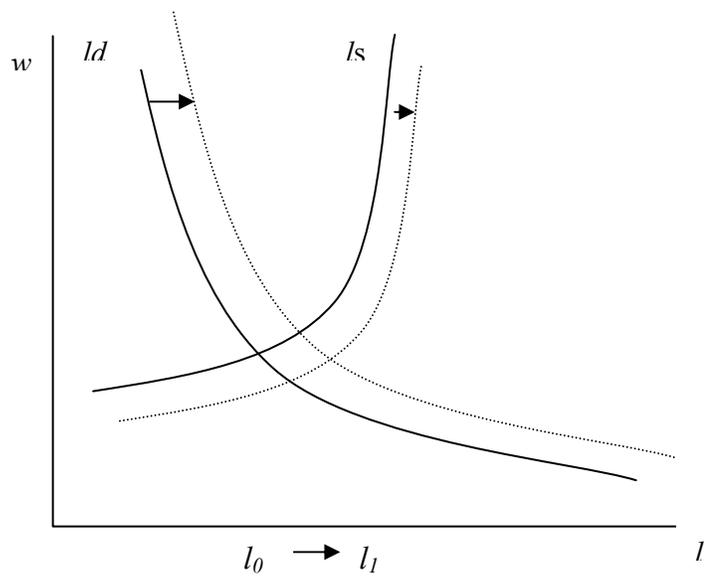


Figure 1b

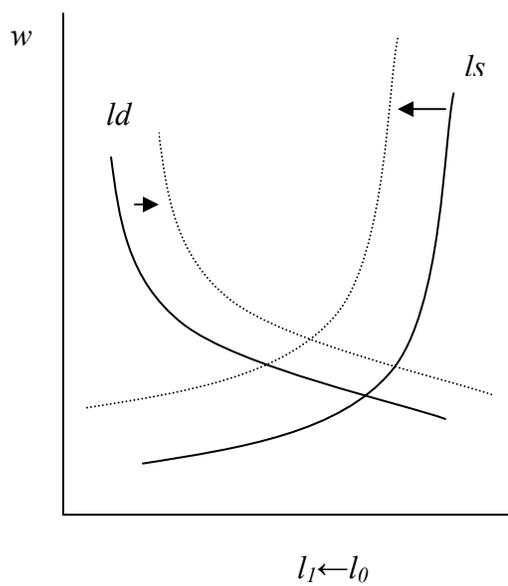
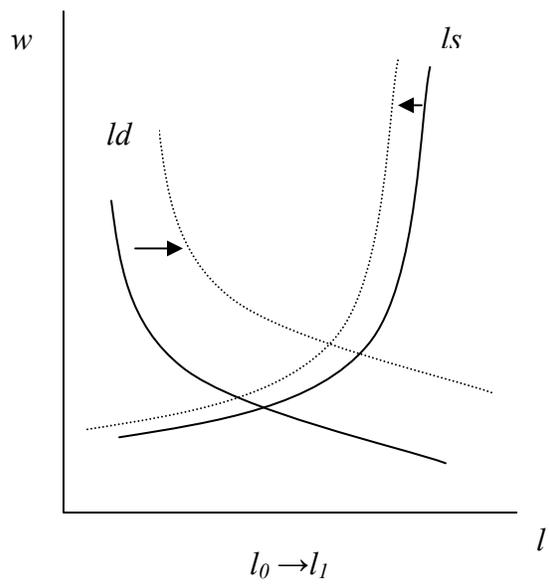


Figure 2a

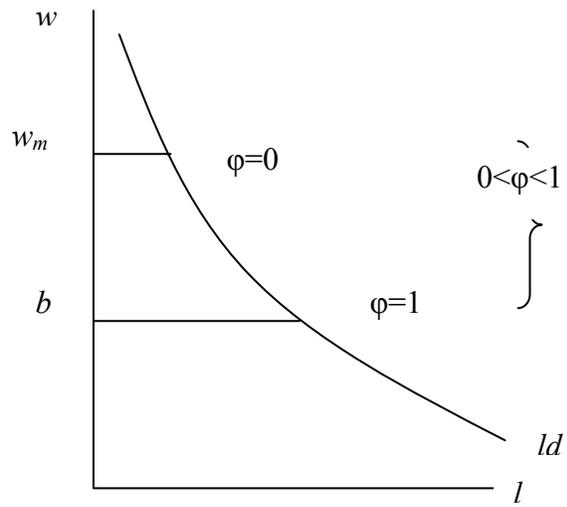
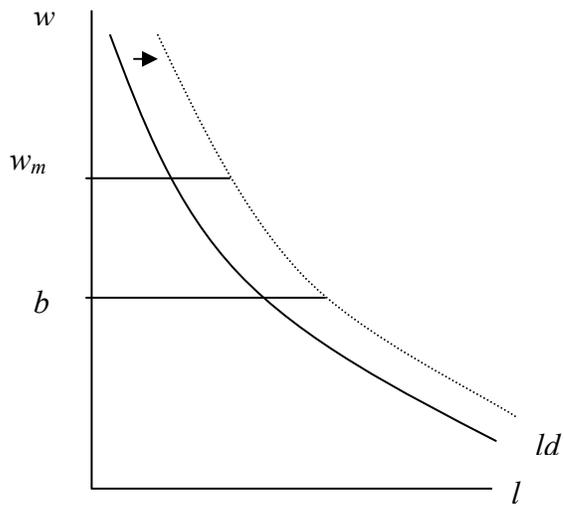


Figure 2b



APPENDIX II: VARIABLE DEFINITIONS AND DATA SOURCES

Consumption tax: consumption-effective tax rate (in percent of pretax value of final consumption. Source: Martinez-Mongay (2000 and 2003).

Labor tax: labor-effective tax rate (in percent of total labor costs). Source: Martinez-Mongay (2000 and 2003).

Capital tax: capital-effective tax rate (in percent of the gross operating surplus). Source: Martinez-Mongay (2000 and 2003).

Output gap: Deviations of actual GDP from potential GDP as a percent of potential GDP. Source: OECD Economic Outlook.

Employment protection index: index measuring the strictness of employment protection laws. It ranges from 0 (low) to 6 (high). Source: Nickell and others (2003) and OECD (2004).

Measure of unemployment benefit entitlement: The OECD summary measure, defined as the average of the gross unemployment benefit replacement rates for two earnings levels, three family situations and three durations of unemployment. For further details, see OECD (1994), The OECD Jobs Study (chapter 8), Martin (1996), and “Measures of Replacement Rates for the Purpose of International Comparisons: A Note”, OECD Economic Studies, No. 26.

Centralization: index measuring the degree of centralization of the collective bargaining system. It ranges from 1 (decentralized) to 5 (centralized). Source: OECD (2004).

Coordination: index capturing the degree of consensus between the actors in collective bargaining. It ranges from 1 (low) to 5 (high). Source: OECD (2004).

Trade union density: portion of workers who are members of trade unions. Source: OECD (2004).

Collective bargaining coverage: share of workers covered by wage-bargaining agreements. Source: OECD (2004).

Product market regulation: index ranging from 1 (low) to 6 (high). Source: Conway, P., and G. Nicoletti (2006).

Unemployment rate: unemployment as a percentage of the labor force. Source: OECD Economic Outlook.

Employment rate of the business sector: employment of the business sector as a percentage of the labor force. Source: OECD Analytical database, and Economic Outlook.

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III. LIQUIDITY CONSTRAINTS AND MORTGAGE MARKET REFORM IN FRANCE⁶²

Objective: Assess the importance of financial market constraints for consumption in France and whether the recent mortgage market reform is likely to ease these constraints.

Main results: Consumption in France is excessively sensitive to current income. While this may be explained by a number of factors, including myopia—a strong preference for consumption today over consumption tomorrow—differences in financial markets, including the extent of financial market supervision, contribute much to variations of excess sensitivity among culturally and otherwise similar European countries. The current mortgage market reform is likely to have only modest benefits. With respect to the reloadable mortgages, limiting the credit to the original nominal amount of the loan prevents capital gains from being used to smooth consumption. Moreover, the reform does not address the issue of switching costs. International experience shows that life-time mortgages are too costly to be much used in the absence of efficient annuity markets.

Policy implications: To make significant progress, further reform should allow withdrawal of capital gains, provided these gains are conservatively measured, and foster the establishment of annuities markets. The *hypothèque* should be replaced by private contracts between lenders and borrowers. Open electronic registries, organized under state supervision, would help reduce legal costs. Consumer protection should be provided through financial literacy programs. Securitization of mortgages loans on a European scale would provide additional funding and greater diversification of risks.

A. Introduction

1. **Mortgage contracts in France are being reformed.** With housing-related assets and liabilities representing by far the largest items on both sides of household balance sheets, the market for housing loans is, at least quantitatively, the most important source of financing for consumers. High costs and complicated procedures have discouraged the use of traditional mortgage loans in France.⁶³ The mortgage market reform aims at facilitating access to homeownership and enabling consumers to take better advantage of valuation gains in home equity. It is also a step toward modernizing the French accessory mortgage system with roots going back to the 19th century.

2. **Easier access to housing credit affects the macro economy mainly through consumption smoothing.** More efficient collateralization and reduced costs of establishing mortgages would make it easier for households to deal with unforeseen spending needs and

⁶² Prepared by Werner Schule.

⁶³ The *caution*, a different form of housing loan, has largely replaced the *hypothèque* (accessory mortgage).

fluctuations in income. Vehicles such as housing loans may also be used to bring forward consumption when expected income rises. A smoother path of consumption would improve household welfare and contribute to less pronounced economic cycles, as shown by recent research.⁶⁴ In France, as elsewhere, real estate prices have risen strongly since the mid-1990s. The direct impact of rising house prices on savings is, however, ambiguous. House owners feel richer and may want to reduce savings, while prospective housing owners are required (or wish) to make a higher down payment at purchase and will therefore need to increase savings to accumulate the needed amount of capital. In any case, through its impact on collateral value, rising real estate prices should facilitate the financing of consumption. Access to credit also affects investment in housing, which is, however, outside the focus of this paper.

3. **From a financial stability perspective, new mortgage market products may raise indebtedness and risk for households and lenders.** New products may encourage households to borrow more, increasing their vulnerabilities to income and asset price fluctuations. Households will need to be well prepared to face these challenges. To this end, transparency about the risks involved and programs to raise financial literacy may be required. The low level of France's household debt in international comparison should limit overall stability risks for the financial system, although credit expansion to households has been strong, and lenders seem to have lowered credit standards to compete for market shares.

4. **This paper is organized as follows:** Section B provides estimates of excess consumption sensitivity, which indicate considerable potential for improving welfare. Section C identifies credit constraints as a prime suspect explaining suboptimal consumption. With richly valued real estate holding a dominant position in household balance sheets (Section D), more efficient financial markets could boost consumption in the short term. The structure and reform of French mortgage markets is discussed in Sections E and F. International experience suggests directions for further reforms (Section G). Section H explores the implications for financial stability and is followed by a concluding section (Section I).

B. Excess Consumption Sensitivity Lowers Welfare

5. **Consumers prefer a smooth consumption path over their lifetime.** This general idea has motivated life cycle and permanent income theories of consumption. Hall's (1978) rational expectations permanent income theory (REPIH) is probably the best starting point. Deviations from a theoretically optimal consumption path are costly in terms of welfare, leading forward-looking individuals to decide on today's consumption on the basis of their expected lifetime resources—the initial stock of wealth and the present value of future labor and nonlabor income. The single most important prediction of the REPIH is that expected changes in current income should have no impact on current consumption. However, this prediction has been overwhelmingly rejected by the data. Temporary changes in income, even if perfectly anticipated, have been found to influence consumer spending contemporaneously; in most countries, consumption has been tracking disposable income closely. This section provides estimates of excess sensitivity (changes in consumer spending in reaction to changes in disposable income) for 11 countries.

⁶⁴ See Catte and others (2004).

Model

6. **Representative consumers maximize the present value of life-time utility subject to a resource constraint.** Under a number of simplifying assumptions, including a time-separable, quadratic instantaneous utility function, indefinitely-lived or Barro-style dynastic households, rational expectations, and frictionless financial markets,⁶⁵ the first order condition for intertemporal utility maximization—the Euler equation—can be written as:

$$C_{PI,t} = \alpha_1 + \alpha_2 C_{PI,t-1} + \varepsilon_t \quad (1.1)$$

This equation implies that consumption follows a random walk with drift, where $\alpha_2 = \frac{1+\delta}{1+r}$, and δ is the constant rate of time preference, r the constant rate of return on assets, and ε_t the error term is uncorrelated with all variables known to the consumer at time $t-1$, including expected disposable income:⁶⁶

$$Y_t = X_{t-1}\beta + v_t, \quad (1.2)$$

with X_{t-1} being a set of variables known to the consumer at time t , and v_t a white noise error term. The model predicts that the conditional expectation of expected income should not affect current consumption; or that all β in (1.2) should be zero in an equation regressing current consumption on a constant and last period's consumption (1.1). In the absence of stochastic shocks ($\varepsilon_t = 0$; $\forall t$), this implies perfectly smooth consumption along a given path.⁶⁷

7. **In the presence of market imperfections, the prediction of the REPIH need not hold.** Asymmetries in information between borrowers and lenders may lead to credit restrictions (Stiglitz and Weiss, 1981). Constraints on households' access to credit can also be imposed by law and regulation. Credit restrictions prevent consumers from borrowing against future income, as well as to ride out fluctuations in income (although these latter restrictions are less widespread and probably less important in reality). The restrictions imposed by the REPIH on consumption can be tested with the following equation,

$$C_t = \alpha_1 + \alpha_2 C_{t-1} + \alpha_3 (Y_t - \alpha_2 Y_{t-1}) + \varepsilon_t. \quad (1.3)$$

The theory holds if $\alpha_3 = 0$.

⁶⁵ Assuming perfect financial markets implies that the consumer can freely lend and borrow at the same rate of interest.

⁶⁶ Hayashi (1982) found the rate of time preference δ (13.2 percent for U.S. data 1948–78) to be significantly different from the risk-free rate of return on assets (3.4 percent).

⁶⁷ The slope of which is given by the ratio of the rate of time preference to the real interest rate. The theoretically equivalent “solved-out” consumption function is derived by solving forward the first order condition for all future periods. It expresses current consumption as a function of income from holding assets (rA) and expected permanent income (y^p).

Estimation

8. **Estimation procedures.** To overcome consistency problems due to the likely correlation of the error terms in Equations 1.3 and 1.2, three different estimation procedures were employed: the nonlinear instrumental variables (NLIV), as in Flavin (1985), with the variables in X_{t-1} as instruments; full information maximum likelihood (FIML) of Equations 1.4 and 1.2, as in Japelli and Pagano (1989). The third column shows estimates of λ in an equation with real consumption and disposable income in first differences (assuming $\alpha_2=1$) as in Campbell and Mankiw (1989). The following table (Table 1) provides excess-sensitivity estimates λ , alongside with measures of household debt in relation to disposable income and GDP.

Table 1. France: Estimates of Excess Sensitivity
Liquidity Constraints and Consumer Debt

	Excess Sensitivity Estimates			Total Household	Households	Total Household
	NLIV	FIML	1st Difference	Debt /1	Housing Debt /1	Debt /1
	λ	λ	$\delta=r$ λ	in percent of Disposable Income	in percent of Disposable Income	in percent of GDP
	(1)	(2)	(3)	(4)	(5)	(6)
Belgium	0.348	0.443	0.242	65.7	50.5	45.0
1988-2003	(1.77)	(3.08)	(1.69)			
Denmark	0.386	0.396	0.113	233.9	163.4	128.4
1982-2002	(4.19)	(5.43)	(0.55)			
France	0.643	0.653	0.433	63.2	40.6	48.4
1978-2005	(10.12)	(9.94)	(2.34)			
Germany	0.565	0.527	0.689	100.5	49.3	78.3
1991-2004	(5.29)	(3.98)	(12.45)			
Italy	0.756	0.839	0.721	39.8	19.2	32.7
1981-2004	(9.89)	(7.46)	(13.88)			
Netherlands	0.221	0.203	0.239	213.2	130.3	123.2
1978-2004	(1.32)	(2.24)	(2.67)			
Sweden	0.105	0.114	0.099	121.4	85.3	75.0
1978-2004	(1.06)	(1.56)	(1.81)			
UK	0.182	0.111	0.112	136.7	111.8	103.6
1978-2004	(1.77)	(5.79)	(4.51)			
USA	0.023	0.142	0.175	123.9	87.7	91.5
1978-2004	(0.12)	(3.27)	(3.17)			
Canada	0.351	0.335	0.188	125.0	75.2	71.8
1978-2004	(2.70)	(2.61)	(4.09)			
Japan	0.222	0.348	0.311	214.4	163.1	133.5
1983-2003	(1.86)	(2.91)	(3.98)			

Source: Insee, OECD, Cansim, AMECO, OEE, EMF-Hypostat, Haver.

1/ Outstanding credit amounts in 2004.

9. **The estimated excess sensitivity varies significantly across countries.** It is relatively important in France, Germany, and Italy, while Belgium, Canada, Denmark, and Japan are in a middle position, and Sweden, the Netherlands, the United Kingdom, and the United States are at the bottom end of the range. Overall, the estimates of α_3 reported in Table 1 are quite close to

earlier estimates.⁶⁸ Interestingly, the estimates presented here, which cover the more recent period, indicate a decline in excess sensitivities in some countries (including in the United Kingdom). This observation is consistent with both lower macroeconomic volatility and more liberalized financial markets since the 1970s.

10. **The results are largely consistent across estimation methods**, although estimates in first differences have produced lower excess sensitivity measures in a number of countries, including France. Nevertheless, relative country positions remain unaffected, with the exception of Denmark, where measured excess sensitivity became insignificant. While most λ s fall well within the range of previous estimates, they were sensitive with respect of the choice of instruments (IV, NLIV) and the specification of the income equation (FIML). Therefore, these results should be seen as preliminary and interpreted cautiously. The availability, coverage, and quality of data have important shortcomings in some countries.⁶⁹ In particular, comparable disposable household income data are not available for all countries. Annual data were used in most cases. Consumption was measured by consumer spending, as insufficient disaggregation of consumer spending in some countries made it impossible to separate out spending on durables. Moreover, the validity of taking nondurables consumption as proxy for overall consumption has become questionable, because relative durables prices have been declining since the mid-1990s.⁷⁰ Likewise, due to lack of data, gross disposable household income was used instead of nonproperty income.

C. Excess Consumption Sensitivity and Credit Markets

11. **Excess sensitivity is inconsistent with the simple REPIH but can be explained after relaxing some of its strong assumptions.** In a model of overlapping generations, consumers care much more about current and near-term income (rational myopia). In models with habit persistence, income shocks have lasting effects on consumer spending, which may be observationally equivalent with excess sensitivity. These models add a lot of realism to the simple perfect foresight model, but it is less clear how big a contribution they can make to the understanding of differences in consumer behavior across EU countries, which are in many ways similar. Are consumers in some EU countries systematically better informed than in others? What would justify assuming different lengths of household planning horizons?⁷¹

12. **Financial market imperfections have been at the forefront of explanations for the inability of households to smooth consumption.** When households cannot borrow freely against

⁶⁸ See Table A1 in the Annex.

⁶⁹ Only postunification data were used for Germany.

⁷⁰ The share of durables in nominal consumer spending has remained roughly constant, but in volume terms, real spending on durables has grown faster than overall consumption, as, since 1996, durables prices have been declining in absolute terms, and even more so relative to the overall consumption deflator.

⁷¹ Information cost may to some extent be linked to the state of the economy. For example, calculating the present value of future income may be more difficult in an environment of greater income uncertainty and high and volatile inflation rates. However, inflation rates have converged to lower levels, and economic cycles appear to have become less pronounced and more closely aligned among EU economies.

their expected future income or to bridge temporary income shortfalls, as well as unforeseen spending needs, they are bound to rely primarily on their current income. Easier access to credits, including those nominally linked to housing, would ease these constraints.

13. **Excess sensitivity has been interpreted as the share of liquidity constrained households.** Campbell and Mankiw (1989) offer this particular interpretation of excess sensitivity. Suppose the share of aggregate income received by liquidity-constrained consumers is λ , so that their consumption is limited by current income. Under these assumptions, the consumption of liquidity constrained households is given by

$$c_{LC,t} = \lambda Y_t, \quad (1.4)$$

and aggregate consumption per capita can be written as:

$$C_t = \alpha_1 + \alpha_2 C_{t-1} + \lambda (Y_t - \alpha_2 Y_{t-1}) + \varepsilon_t. \quad (1.5)$$

Accordingly, the estimated excess-sensitivity parameter measures the relative importance of liquidity constraints.

14. **Households in countries with low estimated excess sensitivity also tend to have higher debt-to-income ratios.** Outstanding amounts of total and housing credits in percent of disposable income (or of GDP) are often-used, though admittedly crude, measures of financial development (Table 1, columns 4–6). Countries with a high degree of consumption smoothing also tend to have high levels of household indebtedness, while high excess-sensitivity countries in general also have lower debt ratios, although there is considerable variation among them. Below-average credit ratios seem to suggest that liquidity constraints are binding, but this need not necessarily be the case.

15. **Low household indebtedness may also result from a limited desire to borrow.** Unfortunately, credit demand and supply are not directly observable. A number of indicators have been suggested to identify demand-side and supply-side determinants of credit. Among them are (i) on the supply side: the wedge between borrowing and lending rates faced by consumers and direct indicators of credit rationing, such as required loan-to-value (LTV) ratios in mortgage lending; and (ii) on the demand side: tax incentives to borrow; demographic factors; preferences, including for housing services; and financing needs (as measured by the house price-to-income ratio).

- The **wedge between borrowing and lending rates**⁷² of corresponding maturities was suggested as an indicator of credit market imperfections (King, 1986). With imperfect competition, the equilibrium volume of credit should be a decreasing function of the wedge. With rationing, however, one would expect a positive relation. And finally, the relation between the volume of lending and the wedge becomes blurred in a model with

⁷² Corrected for transaction costs.

asymmetric information or in the presence of cross-subsidization.⁷³ Consequently, the wedge is likely to provide poor guidance.

- In sharp contrast to the United States, where home ownership has been a long-held public policy priority, and the tax system has skewed **incentives towards consumption of credit-financed house ownership** over renting (Gervais, 2002), public policy in France has given equal weight to subsidizing rentals and supporting home ownership.⁷⁴ In addition, in order to support households' acquisition of real estate property, France has traditionally provided strong incentives to save, including through subsidized administered saving schemes. The French system is therefore more neutral with respect to the decision between renting and buying and tends to postpone ownership until a substantive down-payment can be made. As a result, credit demand and household indebtedness has been lower in France.
- Cross-country comparisons show that consumers in **richer countries** tend to demand more credit, although the relation between income per head and debt is probably not significant, given the wide dispersion of country observations (Figure 1, upper left panel); the relationship between **home ownership** and mortgage credits is not visible, while a **younger population** seems to be positively related to credit demand. On the supply side, **unemployment** is negatively associated with household debt, but again the relation does not appear to be very strong.⁷⁵ Trend lines have been introduced in Figure 1 to facilitate interpretation and should be seen as purely illustrative.

⁷³ Relatively low mortgage rates in the French market may be explained by banks cross-subsidizing mortgage rates to increase their customer base and to tie close customer relations.

⁷⁴ Gervais emphasizes nontaxation of imputed rents in homeowners' income as important factor-skewing incentives in favor of buying, a feature that France has in common with the United States and many other countries.

⁷⁵ Hayashi (1985) has used the unemployment rate as a proxy for liquidity constraints. Boutillier and others (2005) reached similar conclusions.

household wealth has fallen from more than 33 percent in 1995 to less than 27 percent in 2005. Again, higher house prices and a related increase in credit explain most of it, though stock market fluctuations also played a role.

Table 2. French Household Balance Sheets
(In percent of disposable income)

	1995	2000	2005
Non-Financial Assets	295.3	327.2	527.4
Buildings	188.5	195.5	223.3
Land	72.5	99.5	272.1
Others	18.3	16.9	17.9
Financial Assets	209.3	268.7	277.2
Deposits	87.1	89.3	87.5
Market Sensitive	62.2	86.2	80.3
Insurances	50.8	81.4	97.2
Financial Liabilities	62.5	72.8	84.2
Credit	50.2	53.9	63.4
Others	12.3	18.9	20.8
Net Financial Assets	146.8	195.9	193.0
Net Wealth	442.0	523.1	720.4

Sources: INSEE and Banque de France; National Accounts.

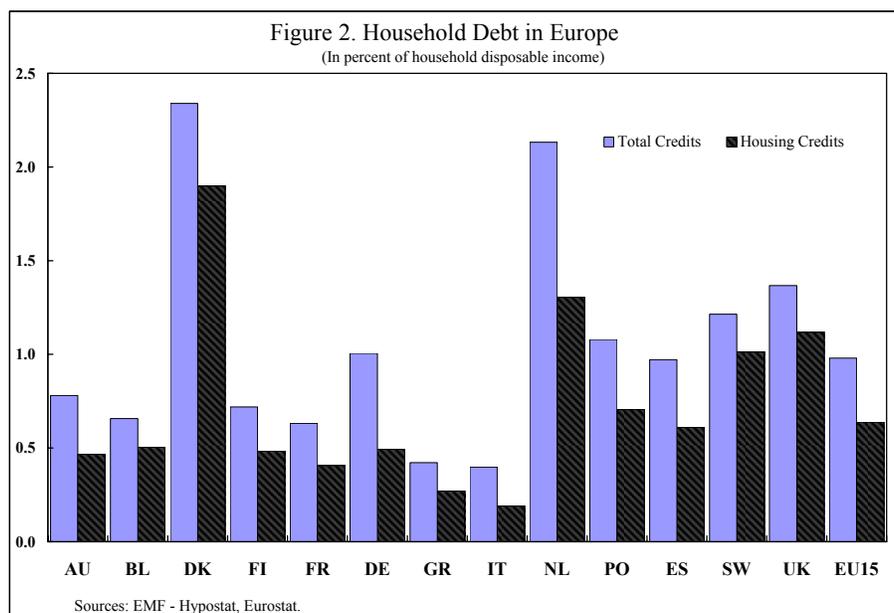
17. **French households have traditionally carried a relatively low level of debt.** In 2005, debt represented 64 percent of disposable income. Although this is a historical record, up some 10 percentage points from the beginning of the 2000s, it remains moderate by international comparison. Together with Italian, Greek, and Belgian households (with debt representing respectively 40, 42, and 60 percent of disposable income in 2004), French households are among the least indebted households in Europe, significantly below the European average of 98 percent in 2004. While in Germany (105 percent), the United Kingdom (129 percent), and Sweden (121 percent) debt ratios remained close to the EU average, they represented above 200 percent of disposable income in Denmark and the Netherlands. Furthermore, since the early 1990s, the number of indebted households has remained fairly stable below 50 percent in France.⁷⁶

18. **Housing loans constitute the largest part of household debt.** French households' total debt relative to income has been among the lowest of the 15 old EU member states (Figure 2). The share of outstanding credits to households associated with real estate has been 65 percent in 2004, about the same as in the euro area.⁷⁷ In France, the level of outstanding housing credits, despite a booming housing market, is lower than in other countries, partly because French housing loans have been used exclusively to finance homeownership, while elsewhere they have

⁷⁶ In 2004, it stood at 48 percent, according to the *Secrétariat Général du Comité Consultatif du Secteur Financier* (2005).

⁷⁷ In Greece and Italy, housing credits represent less than one half of total credits to households.

also been used to finance general consumption, retirement, or transfers to others, including the younger generation.



E. Mortgage Market Reform

19. **The reform of the mortgage market legislation has laid the groundwork for the introduction of new lending products in France.** In July 2005, a bill was adopted by parliament that aimed at “promoting confidence, modernizing the economy, and facilitating household use of mortgage credit.” In March 2006, further details on the implementation of the bill were fixed by the ordinance on the “modernization of collateralization laws.”⁷⁸ The purpose of the reform is twofold: (i) foster the use of mortgage loans by households in order to develop homeownership, by simplifying procedures and reducing the cost of establishing legal guarantees (*hypothèque*); and (ii) encourage equity withdrawal to raise consumption and economic growth. To this end, the regulation creates the preconditions for the development of two new products—reloadable mortgages/equity release mortgages (*crédit hypothécaire rechargeable*) and reverse mortgages (*prêt viager immobilier*).

20. **The goal of the *crédit hypothécaire rechargeable* is to widen the range of credit available to households, while lowering the cost of credit through efficient collateralization.**⁷⁹ As envisioned at this stage, rechargeable mortgages would be created by

⁷⁸ Article 24 of the economic modernization bill empowered the government to reform the civil code in order to increase the efficiency and use of legal privileges such as bail, mortgages, pledges, and guarantees, including through a simplification of seizure procedures. The ordinance *Réforme du droit des sûretés* was presented to parliament on March 22, 2006.

⁷⁹ Additional measures to simplify and lower administrative fees and taxes on mortgages are part of the bill. The reform does not address the tradition of accessory mortgages, possibly because of compatibility problems with conceptually similar property laws in other areas. Therefore, special securitization legislation is needed to help lenders assign loans in a cost-efficient way (CEC, 2005).

housing lenders. They could be reloaded with new credit, up to a maximum of the original loan amount, as past credit is repaid. The ordinance foresees that such a revolving mortgage credit would initially be created in relation with a housing loan but could afterwards be transformed into other types of loans (consumption loans, equity transfer to family members), possibly with different credit institutions.

21. **The goal of the *prêt viager immobilier* is to facilitate equity withdrawal for older homeowners to finance retirement needs, but it raises tricky design and risk management issues.** The new loan can be seen as a modernization of existing (but rarely used) *private viagers*. Reverse or lifetime mortgages provide elderly people with an additional source of income, thereby reducing the fiscal burden associated with ageing. It remains unclear whether credit institutions will introduce reverse mortgages as a lump sum or as an annuity. In addition, reverse mortgages are complex products to manage/hedge by credit institutions due to a series of interdependent risk factors, including (i) the embedded longevity risk associated with the loan, and (ii) the risk that the value of the payment obligation exceeds the value of the collateral. The ordinance foresees that these risks will have to be borne by the lender and cannot fall on the borrowers' heirs. Experience in the United States and the United Kingdom suggest that these features are likely to increase credit costs, reducing the product's attractiveness to homeowners.

22. **Several questions, which are of relevance for the design of new lending products, remain unanswered.** At this stage, credit institutions have not yet marketed the new products. Their attractiveness to households and incentives for lenders to bring them on the market depend on a number of factors that still have to be determined. Among them:

- How portable will home equity loans be from one lending institution to another, once the home equity mortgage has been contracted, and will it be possible or not to contract a mortgage loan from one lending institution and a home equity withdrawal (2nd lien) from another? If none of this is easy, the cost of switching banks might increase, which risks stymying competition in the banking sector; and
- What will be the guidance provided by the supervisory agencies? Proposals to facilitate greater access by homeowners to their home equity and proposals to create more exotic mortgage instruments will raise the risk of mortgage-lending and may lead to higher default rates.

23. The impact of the contemplated reform could be mitigated by the existence of publicly administered schemes, in particular, the *Plans Epargne Logement* (PEL) and *Comptes Epargne Logement* (CEL). The share of housing credit based on these savings schemes as a percent of total lending for housing purposes has been declining steadily in recent years. With historically low long-term interest rates, other housing loans have been offered at more competitive conditions, while the sharp rise in house prices may have reduced affordability disproportionately for those households relying more on subsidization and may have to some extent exhausted loanable funds of administered schemes (Figure A1). It is not clear whether home equity withdrawals would be available on these products. If this is not the case, the fiscal advantages on the PEL/CEL might dissuade borrowers from taking advantage of the new products.

Box 1. France: Structure of Mortgage Markets Across Countries

The following table shows some of the main features of mortgage lending in selected advanced economies. In France, as in most continental European countries, housing loans are typically provided at fixed interest rate terms, while most U.K. mortgage loans are at floating rates. This implies that continental European households prefer to assume inflation risk over interest rate risk. Among the reasons for divergent risk preferences is possibly the historically greater inflation rate stability in continental Europe (though U.K. inflation has become much more stable after the adoption of inflation targeting by the Bank of England).¹ Another reason might be the greater role of administered housing loans, which have been typically provided as long-term loans. Loan-to-value ratios in France (whether in terms of average or peak ratios) are only marginally below the levels in markets with high outstanding housing credits, though prepayment fees are higher and equity release products (although available) have not been used.

Mortgage Markets in Selected Industrialized Countries: General Characteristics

	Typical Rate Structure	Recent/ Peak TV Ratios (in percent) 1/	Typical Term (Years)	Prepayment Fees	Equity Release Products	Tax Regime 2/
Denmark	Fixed	80	30	Administration fee only	Used	Partial Ded; WT; IT
France	Fixed	67/100	15	Limited to 3% of repaid principal 3/	Not used	WT; IT
Germany	Fixed	67/80	25	Lender entitled to compensation for lost income ⁴	Not used	IT
Japan	Fixed	85/100	25	Lender entitled to compensation for lost income	Limited use	Limited term Ded; WT; IT
Netherlands	Fixed	90/115	10	No fees up to 10% of capital prepaid each year	Used	Ded; IT
United Kingdom	Floating	69/110	25	Usually no fees	Used	IT
United States	Fixed/Floating	80/100	30	Usually no fees	Used	Ded; IT
Canada	Fixed/Floating	75/100	25	Penalty fees. No charges on portable mortgages.	Not used	No taxes, no deductibility

Sources: ECB (2003); Mercer Oliver Wyman/European Mortgage Federation (2003); Hypostat 2003 European Housing Finance Review (2004); The Government Housing Loan Corporation of Japan (2004); Cansim; and IMF staff estimates.

1/ Maximum LTV for eligibility to Realkreditobligationer in Denmark. Obligations Foncières in France and Pfandbriefe in Germany are 80 percent, 60 percent, and 60 percent, respectively.

2/ Interest Deductibility (Ded); Wealth Tax on housing (WT); Inheritance Tax on housing (IT). In most countries, capital gains are taxable. However, owner-occupiers also benefit from various degrees of tax exemptions after a number of years of occupation.

3/ 3 percent of prepaid capital maximum.

4/ In the first ten years of the loan.

F. Increased Access to Mortgage Loans May Reduce Household Savings

24. **The mortgage market reform is also geared at mobilizing “dormant” housing wealth for consumption and economic growth.** Though there is disagreement in the empirical literature about the relative role of house prices in explaining consumption,⁸⁰ most researchers concur that the recent rise in housing wealth has contributed to a reduction in savings relative to current disposable income in a number of countries, including the United States, the United

⁸⁰ Aron and Muellbauer (2006) identify poor control of common drivers of both house prices and consumption as the reason for disagreement in empirical work. Households, even if credit-constrained, may find it optimal to have some buffer-stock savings (Carroll, 2001). Therefore, households that cannot borrow against their future income are most likely not literally liquidity-constrained and can use their savings to achieve some limited consumption-smoothing.

Kingdom, and some other European countries. In France, the level and variability of the savings ratio has remained little changed, even though the country has experienced house price increases of a comparable magnitude.⁸¹ The apparently smaller (or by some estimates nonexistent) impact of the recent house-price boom on consumer spending has frequently been related to the greater difficulties of French households to convert higher real estate equity values into cash.

25. **With more efficient collateralization, rising house prices could lead to lower savings.** In France, high costs and complicated administrative procedures, as well as legal difficulties to seize real estate, have been hampering efficient collateralization of housing equity. Consequently, other forms of housing loans have gained importance, though credit institutions have made them conditional on individualized guarantees (*caution*). In comparison with traditional mortgages, which are primarily based on the collateral value of real estate assets, lenders providing these alternative forms of financing put a much larger weight on borrowers' initial asset position and established income record. Young households are typically more likely to face credit constraints and may be required to make a higher minimum deposit. Therefore, French first-time homeowners are older on average and have saved more for the required down payment than for example in the United Kingdom. The reform could ease these constraints if greater use of traditional mortgages in housing finance were to be made.⁸²

26. **The relaxation of rules and strengthened competition could encourage equity withdrawal.** For those who already own real estate, a rise in house prices increases collateral value. The introduction of rechargeable mortgage loans will increase the spendability or liquidity of previously illiquid housing wealth to some extent. But homeowners will not be able to take advantage of capital gains, as the maximum rechargeable amount has been limited by the ordinance to the original (prerevaluation) loan amount. Moreover, it will take some time for borrowers with new mortgage contracts to pay down principle. For these reasons, the near-term prospects for a boost to consumption through real estate equity withdrawal look very limited.

27. **Reverse mortgages may reduce retirement savings, though their use is likely to remain limited.** Savings for "regular" retirement income is unlikely to be much affected, but households may see less of a need to build up a financial buffer stock, if they can draw on their housing equity to cover unforeseen spending needs. Even though reverse—or lifetime—mortgages provide greater flexibility for retirement, the experience with these products in the United States and United Kingdom points to limited use for a number of reasons, most importantly high costs as, in the absence of efficient annuity markets, lenders ask a premium to cover longevity risk.

⁸¹ Catte and others (2004) have found no impact of housing wealth on consumption in France. See also Altissimo and others (2005).

⁸² Japelli and Pagano (1994) found evidence of lower LTV ratios reducing household savings ratios. They also found a positive relationship between household savings rates and economic growth.

G. Directions for Further Reform—Lessons From International Experience⁸³

28. **The role of capital markets in funding is likely to increase.** French lending institutions have traditionally relied on refinancing through deposits, though the share of covered bonds (*Obligations Foncières*) has increased.⁸⁴ While deposits often provide the cheapest form of refinancing, their capacity of raising funds is limited. The relative decline of saving scheme-related lending for housing (see Figure A1) illustrates the need to look for additional funding sources. Moreover, the subsidization of savings schemes is costly (fiscally, as well as in terms of market distortion). Once fiscal incentives are withdrawn, it is likely that households will move savings into alternative forms of investment. In a number of countries, deep mortgage-backed securities (MBS) markets plays a major funding role.

29. **MBS markets can improve the cost structure and reduce the fees charged by mortgage providers,** facilitate the lengthening of mortgage loan maturities, and/or increase mortgage lending capacity. The separation of the various steps involved in providing mortgages allows most countries to have them done more cheaply by specialists of each step. Lowers funding costs—without the need to develop expensive retail funding sources (e.g., branch networks)—allows smaller institutions, like mortgage brokers, to specialize in mortgage origination, thereby increasing competition and leading to greater innovation in the market.

30. **Further development of MBS markets, especially those that help lower transaction costs, will require:** (i) **standardization** of mortgage products, documentation (e.g., mortgage note and deed), and underwriting practices. Pooling mortgages with similar characteristics supports liquidity and reduces the due diligence costs of investors and rating agencies. Such standardization may be a result of regulations (e.g., in Denmark) or market pressure (e.g., in the United Kingdom and the United States); (ii) an adequate **legal, tax, accounting, and prudential framework** for securitization (e.g., with regard to lien registration and enforcement, or bankruptcy protection). The accounting and tax treatment of mortgage securities for both issuers and investors must be clear and complete; and (iii) other prerequisites, such as strong **risk management** practices for secondary marketing (pipeline risk); and availability of mortgage insurance that at least partially protects investors against potential foreclosure-related losses.

31. **A few country cases illustrate broader mortgage market modernization issues.** The Danish, U.S., and U.K. mortgage markets, in particular, are relatively flexible, accommodate demand for fixed-rate, prepayable products through quite different institutional arrangements, and facilitate the issuance of mortgage-backed securities:

- In **Denmark**, the securitization of mortgage loans (via regulation) provides a range of options for households to manage mortgage liabilities. For instance, Danish households

⁸³ This and the following sections draw heavily on previous work done in the International Capital Markets Department of the IMF, including on risk transfer to private households. See Global Financial Stability Report, March 2005, Chapter III.

⁸⁴ In continental Europe, securitization of mortgage loans remains underdeveloped, though covered bonds markets have grown strongly, also across borders, after the introduction of the euro (i.e., *Pfandbriefe* in Germany, *Obligations Foncières* in France, and *Cédulas* in Spain).

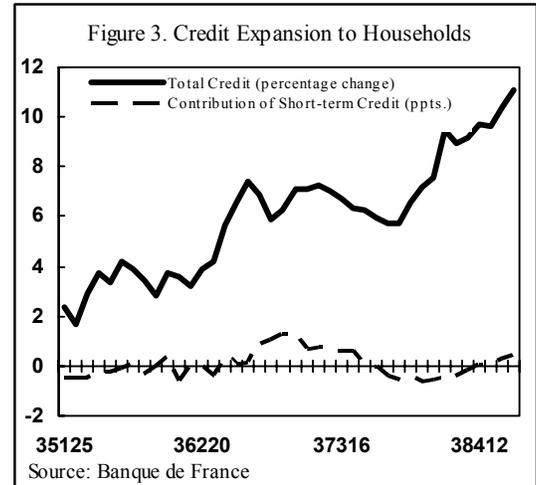
have the possibility, aside from exercising their prepayment option, to buy mortgage bonds in the secondary market and to deliver them to the mortgage originator to net against their loan and reduce principal. Furthermore, the seller of a house can transfer the existing debt on the purchased property to the new owner;

- In the **United States**, the ability of lenders and households to customize mortgage products provides a wide range of options for managing liabilities. The deregulated market structure in the United States has also led to the creation of a wide range of mortgage products with different risk characteristics, and the various stages of mortgage lending are unbundled and often conducted by different entities;
- In the **United Kingdom**, the Miles Review recommended a variety of initiatives to further improve the U.K. mortgage market and identified several barriers to broader and more efficient market activity, including: (i) lack of access for existing customers to a lender's new mortgage products; and (ii) lack of awareness of comparative information on alternative products and interest rate options. The Review also encouraged the government, as a means to provide greater prepayment flexibility, to consider issuing options to provide lenders with a tool to hedge prepayments. In addition, the Review identified several obstacles to cost-effective funding of longer-term fixed-rate mortgages, including the lack of covered bond legislation, possible higher regulatory capital weightings for fixed-rate than variable-rate mortgages, and legislative limits on the proportion of wholesale funding for building societies.

32. **In several countries, residential and other real estate investment products are being considered but are still at a developmental stage.** One key objective is to allow existing homeowners (and institutions) and prospective purchasers (saving to buy) to hedge price movements. A major challenge is to develop products that allow users to hedge price risk as specifically as possible, based on regional or more local market indices. One interesting approach is being developed in the United States by a team of academics through a government-sponsored project to provide house price insurance at a very local level (i.e., based on zip codes). Another aspect where housing-indexed products may be very useful is for potential homebuyers (particularly first-time buyers) increasing their ability to save for a particular property or to invest less than the savings needed to purchase a home as they continue to save for a house. Several jurisdictions are looking to possibly develop housing indices or futures, as well as more conventional Real Estate Investment Trusts (REITs). For instance, the U.K. government recently issued a discussion paper on the possible introduction of REITS, as potentially helping to promote greater liquidity, more efficient investment decisions, and wider access to smaller investors. The discussion paper sets out four main objectives: improving the quality and quantity of finance for investment in commercial and residential property; expanding access to a wider range of savings products on a stable and well-regulated basis; protecting all taxpayers by ensuring a fair level of tax is paid by the property sector; and supporting structural change in property markets to reduce costs and improve flexibility and quality for tenants.

H. Stability Implications—Household's Balance Sheets

33. **Greater household access to credit may have implications for financial stability.** New mortgage instruments will increase households' ability to smooth consumption and to absorb financial and real economic surprises and shocks. More efficient mortgage markets could also raise the financial systems' ability to improve the intertemporal allocation of resources from savers to investors. However, forward-looking financial risk will need to be assessed and managed reasonably well.⁸⁵ This section will look particularly at households' exposure to risk and what might be needed to raise their ability to cope with these risks.



34. **Credit growth to households has been strong in recent years.** In France, as in most other industrialized countries, credit growth to households has been driven by housing loans. Total credit to households has increased by 10.5 percent in 2005, most of which was long-term and related to housing. Short-term credit grew strongly in 2005, but its share in total credit has traditionally been small (about 5 percent in recent years), and its contribution to overall credit growth has been minor (Figure 3). Reportedly, lending standards loosened as well in 2005. Supervisors, including in the United States and France, have therefore issued guidance to banks emphasizing the importance of sound underwriting going forward, in the context of a liberalization of the residential mortgage market. It remains to be seen how lenders will react.

35. **As elsewhere, the share of flexible-rate and longer-maturity mortgages has increased.** The trend to longer maturities, flexible rate, and in some cases interest only, is a global phenomenon. With increased confidence in monetary policies' ability to keep inflation low, households may consider the risk of higher interest rates limited. Conversely, more households may be inclined to reduce monthly mortgage payments to keep home ownership affordable. Increased financing needs may also explain the trend towards longer maturities and the increased attractiveness of new longer-term mortgages. In France, home ownership has traditionally been financed with 5 year and longer fixed-rate loans, with more than 50 percent of outstanding loans in 2005 still at rates fixed for 10 years or longer. However, the share of new housing loans at variable interest rates or an initial rate fixed for one year or less has reached almost 30 percent in 2005. With an average duration slightly above 15 years, housing loans in France have been among the shorter-termed in Europe.

36. **The balance sheets of French households have changed significantly over the last two decades, but residential real estate remains the largest asset class.** The share of financial assets, and in particular market sensitive assets,⁸⁶ has increased significantly in recent years.

⁸⁵ For a theoretical exposition see Schinasi (2006).

⁸⁶ Securities held directly or through mutual funds and corporate-sponsored savings schemes.

Financial assets today make up about 50 percent of households' assets, with market sensitive assets representing 33 percent of total financial assets. While declining, residential real estate is still the largest asset in household balance sheets, accounting for the other half of total assets (down from 71 percent at the beginning of the 1980s). Home ownership remains a major goal of households (as highlighted for example by the continuing popularity of housing savings accounts), as only 56 percent of French households are homeowners, compared to 63.6 percent on average in the EU.

37. **Raising financial literacy is essential for consumer protection.** The mortgage market reform has been mindful of protecting consumers. While it would have been prudent to require conservative estimates of the collateral value of real estate equities, the limitation on the maximum reloadable credit to the original loan amount is very restrictive. Alternatively, experience in other countries shows that households can be better prepared to manage greater risks through a government or bank-sponsored program of financial literacy. Such a program, which is a very important component of any liberalization of mortgage markets, has been set up under the auspices of AMF, the securities regulators. If successful, this program should increase confidence in consumers' ability to take on greater financial risk.

I. Conclusions

38. **Rechargeable mortgages are attractive and may encourage collateralization, but bolder measures are needed to limit legal and other fees.** The attractiveness of rechargeable mortgages has been raised by leaving open a wide range of credit purposes for which this facility could be used. Without the need to reestablish a *hypothèque*, the costs of collateralization should fall. Nonetheless, consideration should be given to replace the existing *hypothèque* requirement by a private agreement between the lender and the owner of the mortgage property.

39. **The reform's immediate macroeconomic impact is likely to be very limited.** Housing represents a significant, but untapped, source of flexibility in the management of these balance sheets. To free this source, further reform should do away with the maximum borrowing level imposed by the ordinance and allow withdrawal of capital gains, provided these gains are conservatively measured, and foster the establishment of securities markets. Open electronic registries, organized under state supervision, would help reduce legal costs, and switching costs should be addressed by strengthening competition, including through the enforcement of competition rules.

40. **Lower switching costs would foster more efficient bank customer relations.** The easier it will be for households to switch banks, the lower the incentive for banks to compete for clients by cross-subsidizing housing loans. In the process, the role of traditional relationship banking will gradually decline. As a result, the structure of lending rates and banking fees will likely change in favor of nonhousing-related lending. Households are set to reduce further deposit holdings in search of the best investment opportunities. Consequently, mortgage lenders will need to make greater use of market refinancing, raising the demand for special purpose vehicles (SPV) and similar instruments.

41. **Deep MBS markets on an EU-wide scale would provide opportunities for additional funding and risk diversification.** Retail deposits have traditionally been the main

source of funding, while covered bond markets have grown rapidly and have become integrated EU-wide. Conversely, MBS markets have not kept pace in France and other euro area countries, despite the benefits for risk management. By removing assets from bank balance sheets, greater use of MBS would reduce banks' vulnerability to fluctuations in house prices.

42. **The potential implications for macroeconomic and prudential policies and financial stability of greater household access to credit do not seem a priori to be excessively problematic.** From a cross-country perspective, these potential risks seem to be manageable, especially given the relatively low levels of household debt in France. In this light, the imposed very restrictive maximum level of borrowing in relation to the value of the real estate seems excessively cautious. More flexibility for households to manage their balance sheets could be achieved by allowing liquidization of conservatively measured real-estate capital gains while providing consumer protection through information and transparency requirements and by raising households' financial literacy.

Figure A1. France: Structure of Housing Loans by Lending Institution
(1993:1 - 2005:3)

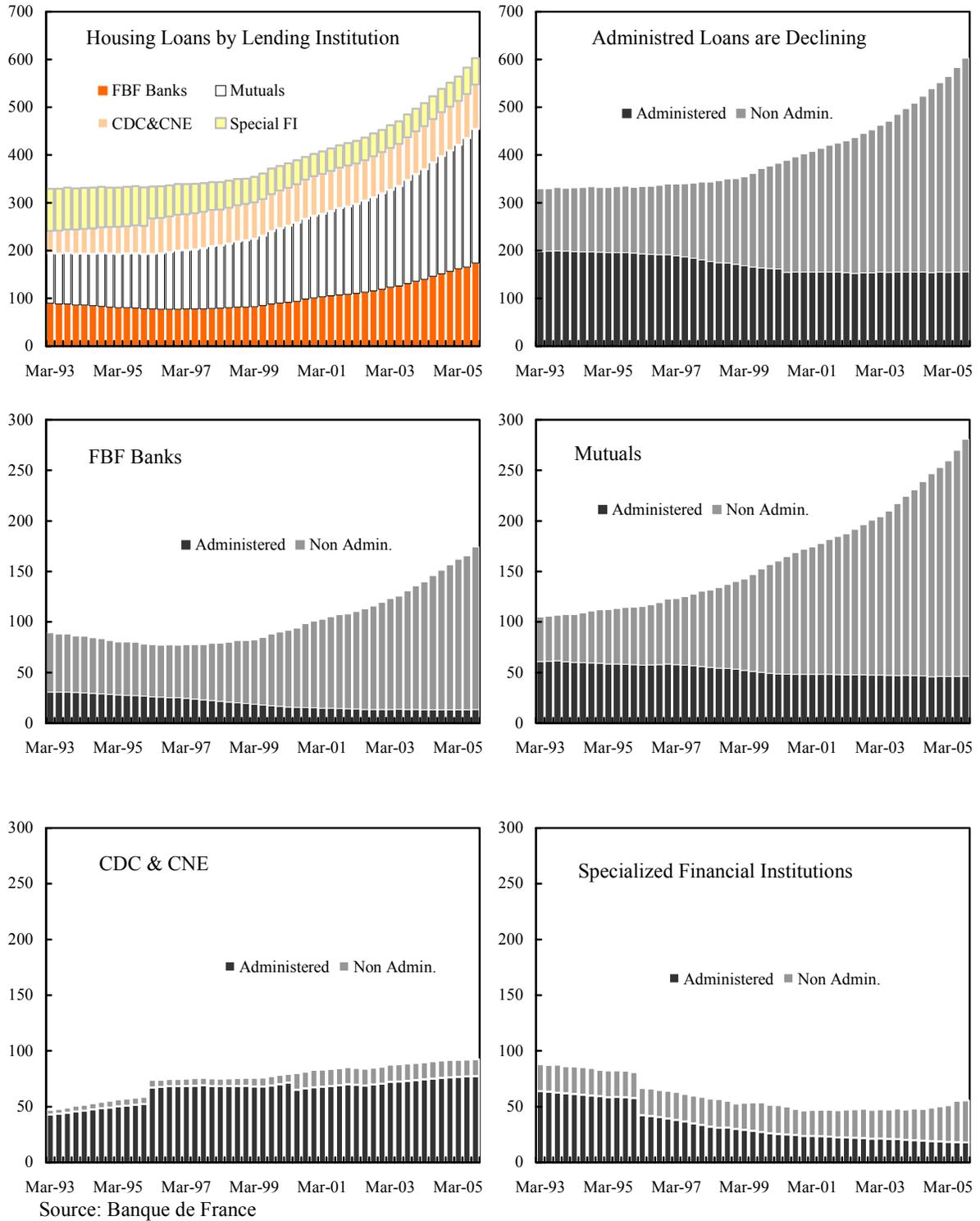


Table A1. Excess Sensitivity: Earlier Estimates (λ)

	Japelli/Pagano (1989)	Campbell/Mankiw (1989)	Flavin (1985)	Hayashi (1982)	Sefton/In 'T Veld (1999)
France		1.09 (3.21)			> 1 ("failed") /1
Germany		0.65 (3.55)			0.51 (7.30)
Italy	0.58 (22.40)	0.40 (4.26)			
Sweden	0.12 (1.10)				
United Kingdom	0.40 (1.77)	0.22 (1.45)			0.32 (9.40)
United States	0.21 (-2.30)	0.48 (3.03)	0.11 (8.07)	0.17 (0.66)	0.35 (3.80)
Canada		0.62 (2.87)			0.18 (5.60)
Japan	0.22 (1.86)	0.55 (5.76)			

1/ Sefton and In'T Veld considered their approach failed to explain consumer behavior in France because their estimate of λ exceeded 1.

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ANNEX I. FRANCE: OVERVIEW OF STAFF RESEARCH SINCE 2000

In the last decade, France's economic growth has on average outperformed that of the euro area, but it has not kept up with other advanced industrial countries, such as the United Kingdom or the United States. Important reforms have been implemented, but labor utilization remains unsatisfactory, with high unemployment. Budget deficits, public debt, and the tax burden all remain high. Looking forward, the key policy questions are how to raise trend growth and secure fiscal consolidation in the face of impending population aging and how to allow the economy to benefit better from the global expansion. Recent IMF research has focused on these challenges.

As pointed out by Nadal de Simone (2003), the recovery in French trend growth in the 1990s resulted mostly from capital deepening and an increase in structural employment. Total factor productivity growth instead declined from an average of 2 percent per year during the 1980s to 1.2 percent during the 1990s (Everaert and Nadal de Simone, 2003). Capital deepening was due to investment in new technologies. With the notable exception of computers and software, however, labor-saving investment decelerated sharply during the 1990s (Estevão and Levy, 2000).

Despite a gradual decline in the Nairu, the French economy was nearing potential at the beginning of this decade (Ubide-Querol, 2000). However, given the high degree of synchronization between the French cycle and the rest of the world's (Nadal de Simone, 2002), GDP growth was affected by the global downturn in 2001/02. Furthermore, inflation showed persistence due to idiosyncratic factors and higher expected labor costs, following the introduction of the 35 hours workweek (Weisfeld, 2002; and Nadal de Simone, 2005). In stark contrast to Germany, the subsequent recovery in France was entirely driven by domestic demand, including private consumption. While French consumption tracks households' disposable income closely, financial wealth effects are smaller than in the United States, and housing wealth does not seem to have a measurable impact (Schule, 2004). Limited wealth effects may explain why France experienced only a moderate decline in the private household savings rate. On the external side, France's trade balance moved into deficit in 2004, after net trade contributed negatively to GDP growth for the third year in a row. This happened against a backdrop of booming world trade, sluggish demand within the euro area, and continued euro appreciation. Allard (2005) looks at the divergent export performances between France, Germany, the United Kingdom, and Italy and finds that French export weakness relates to regional and product specialization, relative cyclical positions, and price and cost competitiveness. However, there are unexplained negative residuals, which point to the economy's structural difficulties to adjust quickly to changing external developments. Khan (2006) indeed finds that France's relative high degree of unionization and high ratio of the minimum to median wages exert a negative impact on TFP growth.

France's strong employment performance in the second half of the 1990s can be partly explained by labor market policies. Estevão (2003) finds that direct subsidies to job creation have been the most effective in raising employment rates, while expenditures on training programs seem to have been largely ineffective. The effectiveness of employment subsidies in the 1990s was associated with overall wage moderation (Detragiache and Estevão, 2002)—defined as a reduction in productivity-adjusted real wages at a given rate of unemployment. The latter could be explained both by a change in union members' preferences favoring employment, and weaker overall union bargaining power. However, the reasons for the change in wage bargaining behavior are hard to pin down (Estevão, 2001; and Estevão and Nargis, 2002). The combination of wage moderation and outward shifting labor demand may have been key, which together cut the long-run unemployment rate by one third from its peak in the mid-1990s (Detragiache and Estevão, 2002). Looking forward, there is uncertainty on whether wage moderation could be sustained. While it was accepted in the context of the reduction of the workweek to 35 hours, which preserved monthly income, there has been increasing discontent with slow wage progression. Furthermore, the minimum wage has increased substantially, compressing wages at the low end. Estevão (2006) finds that the 35-hour workweek initiative did not improve welfare and lowered it for some groups in society.

Strong employment growth did not yield a “fiscal dividend”, however, because of an expansion of social programs, public sector jobs for the young, and the growing fiscal costs of reductions in social security contributions (Detragiache and Estevão, 2002). Mahfouz (2000) recommends that efforts to alleviate the tax burden should target supply, and focus on well-identified distortions that result in disincentives to work. Along similar lines, Mottu (2003) calls for broadening of tax bases, reducing marginal rates, and simplifying the tax system, while observing that straightforward reductions in taxes funded by expenditure cuts would be the way to go. In any case, within the boundaries of the SGP, more emphasis should be placed on spending rules, which do not require discretionary measures to offset cyclical fluctuations in revenues, allowing automatic stabilizers to work (Di Bella, 2002; and Dabán and others, 2003).

Against this background, it will be essential that further labor market reforms rely less on budgetary resources. Young and unskilled workers are the most affected by current labor market practices, including high minimum wages, employment protection legislation, and high unemployment benefits. Giuliano (2004) finds that high youth unemployment in France is not driven by mobility-induced search. Increasing training, with its costs shared between employer and employees, may thus be a valid avenue to improve the employment experience of low-skilled workers. Zhou (2005) analyzes the consequences of the employment protection legislation (EPL) on unemployment in France. Calibrating a search matching model, she argues that a partial reform that leads to flexible regulation on fixed-term contracts—but keeps the stringent permanent job security provision unchanged—is more likely to raise unemployment. A single contract with low firing costs would be a more effective way to lower unemployment. This explains why the new labor contract for small

enterprises introduced in 2005 is unlikely to have appreciable long-term effects on employment (Zhou, 2006a). Furthermore, calls to adopt a Danish style flexicurity model appear to be misguided, as its budgetary costs would be excessive (Zhou, 2006b). In addition, in France, where obtaining and defending vested interests is an ingrained phenomenon, providing generous unemployment benefits will raise moral hazard and hinder the effective implementation of the flexicurity model.

Labor, product and services market reforms have mutually reinforcing benefits. Despite the liberalization of France's financial sector since the mid-1980s, state interventions remain widespread and often create distortions. For instance the sluggish adjustment of administered interest rates has hampered the pass-through of monetary policy. Allard and Fonteyne (2004) estimated that, as a result, about 1½ percentage points of consumption growth was temporarily forgone during the last. ECB easing cycle. Schule (2005) measures the macroeconomic effects of reforms which would increase competition in labor, product, and services markets. Simulations with the Fund's Global Economic Model (GEM) show that the long-run gains are large, up to 15 percent of GDP. Comprehensive reforms across all markets ensure a more equal distribution of the gains, measured in consumption units, while synchronizing structural reforms among the large euro area countries allows monetary accommodation (Everaert and Schule, 2006). As a result, transitory adjustment costs are significantly lower.

References

- 1/ Allard, Céline, and Wim Fonteyne, 2004, "Public Intervention in Financial Markets: Obstacles to Monetary Transmission?" IMF Country Report No. 04/346.

The liberalization of France's financial sector since the second half of the 1980s should have improved the transmission of monetary policy to the real economy. However, the financial landscape in France remains characterized by a large number of idiosyncrasies that affect monetary transmission—many of which caused by government policies. This paper aims at providing a comprehensive overview of these idiosyncrasies and their likely or potential impact on the transmission of monetary policy. It is not exhaustive, however, as the investigation of a wide range of specific features necessarily limits the set of available analytical tools. The empirical analysis focuses on two particular aspects of monetary transmission: the transmission from policy interest rates to the interest rates faced by economic agents and an analysis of the interest rate sensitivity of household consumption. The first aspect was chosen because government interventions play a direct role in this crucial link in the transmission mechanism, the second because the literature suggests that French consumption is relatively insensitive to monetary policy. Although government interventions in financial intermediation impact resource allocation in ways that are often closely interrelated with the transmission of monetary policy, the focus here is on aspects of the latter. Econometric analysis shows that sluggish adjustment of administered rates

significantly hampered the pass-through of changes in monetary policy rates to consumption credit rates. Owing to this phenomenon, about 1½ percentage point of consumption growth appears to have been temporarily foregone during the latest ECB easing cycle. Sluggish adjustment unrelated to the main administered savings scheme (Livret A) causes another 1½ percent of “missing” consumption. Other government interventions could be a key contributing factor.

JEL Classification Numbers: C51, E43, E52, G28

Keywords: Econometric estimation, monetary policy, government policy and regulation, France, euro area

2/ Allard, Céline, Mario Catalán, Luc Everaert, and Silvia Sgherri, 2005, “Explaining Differences in External Sector Performance Among Large Euro Area Countries,” IMF Country Report No. 05/401.

During 2001–04, the performance of the external sector differed markedly among the four largest euro area countries. This study describes the evolution of the traditional determinants of exports and imports—domestic and foreign demand and cost and price competitiveness—and econometrically assesses their contributions to the evolution of trade volumes during this period. While it is found that these factors go a long way in explaining differences across countries, considerable unexplained residuals remain, indicating that, barring data problems, other factors, unobservable or omitted, also played an important role during 2001–04. Several stylized facts stand out. Imports were well explained by the import content of domestic and foreign demand, while competitiveness played only a secondary role. For exports, all countries benefited from rising global demand, with Spain profiting the most and France the least. Similarly, all countries endured real exchange rate appreciation, with Italy suffering the most and Germany the least. Interestingly, the unexplained part of exports was positive for Germany—thus exports behaved more strongly than expected—and negative for the other three countries.

JEL Classification Numbers: C51, F14

Keywords: Econometric estimation, country studies of trade, France, Germany, Italy, Spain

3/ Dabán, Teresa, Enrica Detragiache, Gabriel Di Bella, Gian Maria Milesi-Ferreti, and Steven Symansky, 2003, “Rules-Based Fiscal Policy in France, Germany, Italy and Spain,” IMF Occasional Paper No. 225.

In recent decades, France, Germany, Italy, and Spain—along with most industrial countries—witnessed a sharp rise in the size of government and a large accumulation of

public debt. High public expenditure and debt are well-recognized sources of concern to policymakers, especially as population aging increases spending on pensions and health care, while reducing the labor force and therefore economic growth and the tax base. In practice, reducing public spending and government debt is politically difficult because the process inevitably leaves some groups worse off. To overcome these difficulties, an increasing number of countries have adopted formal fiscal rules, such as balanced-budget rules or multiyear frameworks that limit discretionary fiscal policy. The proponents of rules argue that the commitment to a medium-term plan for public finances makes it easier for fiscal authorities to withstand pressures for higher spending and delayed fiscal adjustment. Critics highlight that rules may constrain the ability of governments to run countercyclical fiscal policy and express skepticism on the effectiveness of rules, because of the scope left for creative accounting.

This paper studies the design of fiscal rules and frameworks, with particular reference to France, Germany, Italy, and Spain. It argues that the four countries should place more emphasis on spending rules and suggests that countries should maintain medium-term targets for the budget balance—or alternatively, the stock of public debt—geared to long-term policy objectives. But it points out that rigid adherence to annual deficit targets can impart a procyclical bias to fiscal policy through contractionary measures to buttress revenues in a downswing and a temptation to spend windfall tax receipts in an upswing. A binding spending rule consistent with the medium-term deficit or debt target and with tax policy objectives would allow cyclical revenue fluctuations to be reflected in annual outcomes for the budget balance. But it would not sacrifice—and perhaps it would even enhance—policy credibility. Nonetheless, a number of issues arise in designing effective spending rules. Should rules be imposed on "real" or nominal spending? How comprehensive should the definition of spending be? What safeguards can be put in place to ensure that the rules are credible? How can they be made to work in a decentralized system, where regions and states enjoy considerable autonomy? This study reviews the implementation issues and provides some practical answers to these and other questions.

JEL Classification Numbers: D78, H30, H62, H63

Keywords: Positive analysis of policy-making, fiscal policies, budget deficit, public debt, France, Germany, Italy, Spain

4/ Detragiache, Enrica, and Marcello Estevão, 2002, "The Fiscal Effects of Job-Rich Growth in France," IMF Country Report No. 02/249.

While high growth certainly contributed to an underlying improvement in the public finances during 1997–2000, the attendant high rate of job creation did not result in a significant decline in spending on labor market and poverty reduction programs, owing to the procyclical behavior of unemployment insurance coverage—offsetting the impact of a lower

number of unemployed—and an ongoing trend toward expansion of social and active labor market programs.

JEL Classification Numbers: H30, J32, J65, J68

Keywords: Fiscal policy, active labor market policies, unemployment insurance, France

5/ Detragiache, Enrica, and Marcello Estevão, 2002, Wage Moderation and Long-Run Unemployment in France, IMF Country Report No. 02/249.

As could be expected, wage moderation and the subsequent outward shift in labor demand have significant potential to improve the overall functioning of the labor market. In the long run, they are expected to cut the equilibrium unemployment rate in half from its reading in the mid-1990s, provided the factors underlying wage moderation do not reverse.

JEL Classification Numbers: E24, J31, J32

Keywords: Unemployment, job creation, wages, France

6/ Di Bella, C. Gabriel, 2002, “Automatic Fiscal Stabilizers in France,” IMF Working Paper 02/199.

In this paper, a simple methodology to assess the effectiveness of automatic stabilizers is proposed and empirically tested using French data for the period 1970–2000. The paper concludes that fiscal stabilizers have dampened output variability by approximately 35–45 percent depending on the measure of potential output used. In addition, the results indicate that fiscal stabilizers mainly operated through the reduction of private investment fluctuations from 1970 to 1985, and through the reduction of private consumption variability thereafter. Due to the counterfactual nature of the analysis performed, the simplicity of the theoretical model, and simultaneity issues that might introduce biases, the results can at most be interpreted as approximations of the phenomenon that is analyzed.

JEL Classification Numbers: E32, E62

Keywords: Automatic stabilizers, fiscal policy, France

7/ Estevão, Marcello, and Joaquim Levy, 2000, “The New Economy in France: Developments and Prospects,” IMF Staff Country Report No. 00/148.

The dynamism of the French economy, which in the late 1990s was characterized by strong growth, a falling unemployment rate, and low inflation, raised the question of whether the country was on the verge of experiencing a period of sustained growth such as experienced

by the United States since the mid-1990s. This study analyzes the sources of changes in French labor productivity growth, including the expansion of high-tech activities, and reviews a number of policy issues connected with the development of an ICT-based new economy. The main conclusion is that the lackluster productivity growth in France in the late 1990s, is attributable to a deceleration in overall capital deepening on the heels of a continued moderation in labor costs. This deceleration reflects a waning of the heavy investment in labor-saving technologies that characterized most of the 1980s, which itself was a response to the escalation of labor costs after the mid-1970s. The deceleration in capital deepening does not, however, extend to computer hardware and software. Investment in this category has grown at rates close to 30 percent in recent years. Such a strong pace has been reflected in an increasing—albeit still small—contribution to labor productivity growth and in the rapid expansion of high-tech businesses.

JEL Classification Numbers: E22, O47

Keywords: Capital investment, ICT, economic growth, productivity, France

8/ Estevão, Marcello, and Nigar Nargis, 2002, “Wage Moderation in France,” IMF Working Paper No. 02/151.

Using household level data for France from 1990 to 2000, this study estimates a relationship between wages and unemployment taking into account compositional, time, and regional effects. It shows that this relationship shifted outward during the 1990s most likely because of a structural change in workers’ behavior, i.e., “wage moderation.” The outward shift was particularly large between 1996 and 2000 and undoubtedly contributed strongly to the exceptional employment performance during that period.

JEL Classification Numbers: D2, E2, J23

Keywords: Employment, wages, bargaining, structural change, labor market

9/ Estevão, Marcello, 2001, “Labor Market Developments and Wage Moderation in France in the 1990s,” IMF Country Report No. 01/198.

The French economy grew at robust rates between 1997 and 2000 without signs of price acceleration. Labor market performance was also strong with unemployment rates falling from 12¼ percent in mid-1997 to 8½ percent in May 2001 and employment rising particularly sharply during the same period. This expansion generated substantially more jobs than the 1987–89 expansion. Part of the overall difference in employment growth between both periods can be explained by the effect of government policies that aimed at reducing unemployment rates mainly among less skilled workers. Another remarkable aspect

of the 1990s is that once the effects of changes in the composition of the labor force and variations in the unemployment rate are taken into account, real hourly wages grew much less than productivity throughout the 1990s. This study estimates a microeconomic model based on the bargaining models described in Layard and others (1991) to assess the role of wage moderation in reducing unemployment in France. The econometric exercise points to a significant degree of wage moderation during the 1990s consistent with a decline in labor union bargaining power or an increase in society's preference for employment over wages.

JEL Classification Numbers: C78, E24, J51

Keywords: Employment, bargaining models, wage moderation, labor unions, preferences, France

10/ Estevão, Marcello, 2003, "Employment and Wage Effects of Active Labor Market Policies," IMF Country Report No. 03/335.

France's strong employment performance in the second half of the 1990s can be partly explained by the labor market policy mix it pursued. Policies favored subsidies to direct job creation and put less resources into training programs. Consistently, measures with a positive employment effect also contributed to wage moderation. However, as these policies have a high budgetary cost, they are not a good substitute for reform of labor market institutions that affect employment negatively.

JEL Classification Numbers: E24, J32, J38

Keywords: Active labor market policies, employment, wage moderation, France

11/ Estevão, Marcello, and Filippa Sá, 2006, "Are the French happy with the 35-hour workweek?" IMF Working Paper (forthcoming).

Legally-mandated reductions in the workweek can be either a constraint on individuals' choice or a tool to coordinate individuals' preferences for lower work hours. This study confronts these two hypotheses by examining the consequences of the workweek reduction in France from 39 to 35 hours, which was first applied to large firms in 2000. Using the timing difference by firm size to set up a quasi-experiment and data from the French labor force survey, we show that the law constrained the choice of a significant number of individuals: dual-job holdings increased, some workers in large firms left for small firms where hours were not constrained, and others were replaced by cheaper unemployed individuals as relative hourly wages increased in large firms. Employment of persons directly affected by the law declined, although the net effect on aggregate employment was not significant.

JEL Classification Numbers: C21, E24, J22

Keywords: Workweek, coordination, job-sharing, welfare

12/ Everaert, Luc, and Francisco Nadal De Simone, 2003, "Capital Operating Time and Total Factor Productivity in France," IMF Working Paper No. 03/128.

Data on the weekly operating time of capital improve the measurement of effective capital input in production. The production function of the French business sector is found to be consistent with a Cobb-Douglas technology under constant returns to scale. Total factor productivity growth, estimated as an unobservable variable, has declined steadily since the late 1970s, but more slowly since 1994. During the 1990s, a secular increase in shift work raised the operating time of capital and began to contribute positively to growth, albeit only slightly.

JEL Classification Numbers: E22, E24, E27, E32

Keywords: Capital stock utilization, total factor productivity, labor organization

13/ Everaert, Luc, and Werner Schule, 2006, "Structural Reforms in the Euro Area: Economic Impact and Role of Synchronization Across Markets and Countries," IMF Working Paper No. 06/137.

Using the IMF's Global Economic Model, calibrated to the European Union, the effects of reform in product and labor markets are quantified for both a large and a small euro area economy. When markups in these markets are reduced, there are sizable long-term gains in output and employment. Most of these gains accrue to the reforming country regardless of whether reform takes place elsewhere; conversely, spillovers of reform elsewhere are limited. Labor and services market reforms have transitional costs as they induce a temporary decline in consumption, but raising competition in goods markets can mitigate some of these costs. Thus, coordinating the timing of reforms across markets is beneficial, and the more so the more open the reforming economy. In addition, synchronizing structural reforms across large countries of the euro area could eliminate transition costs. Increased supply would allow monetary policy to ease without jeopardizing price stability objectives, though in practice uncertainty may prevent full accommodation.

JEL Classification Numbers: D58, E52, F47

Keywords: Economic policy, general equilibrium models, competition, markups, monetary policy

- 14/ Giuliano, Paola, 2004, “Unemployment, Wage Growth, and Job Mobility of Young Workers in France and West Germany,” IMF Country Report No. 04/346.

While France and Germany have similar average unemployment rates, youth unemployment in France (and other industrialized countries) is much higher than in Germany. For the young in France, this leads to a significant loss in time spent working and moderately lower wage growth compared to Germany. A counterfactual exercise suggests that a lower return to experience could be responsible for lower early wage growth in France. “On-the-job” wage growth is higher in Germany than in France, but this does not appear to be due to the higher labor force attachment in Germany. On the other hand, “between-jobs” wage growth contributes similarly to wage growth in both countries. Consequently, increased training could enhance the employment experience of the low-skilled young worker in France provided that its cost is shared between the employer and the employee.

JEL Classification Numbers: E24, J24, J31, J63

Keywords: Youth unemployment, job experience, human capital, France, Germany

- 15/ Kabundi, Alain, 2004, “Estimation of Economic Growth in France Using Business Survey Data,” IMF Working Paper No. 04/69.

This paper proposes a new way of computing a coincident indicator for economic activity in France using data from business surveys. It uses the generalized dynamic factor model à la Forni and others (2000) to extract common components from a large number of survey observations. The indicator obtained forecasts economic activity with a relatively high degree of accuracy before the release of actual data.

JEL Classification Numbers: C33, C42, C53, E37

Keywords: Dynamic factor models, survey data, economic forecasting

- 16/ Khan, Tehmina, 2006, “Productivity Growth, Technological Convergence, R&D, Trade and Labor Markets: Evidence from the French Manufacturing Sector,” IMF Working Paper, forthcoming.

This paper investigates total factor productivity (TFP) growth in 14 manufacturing sectors during 1980–2002. Comparisons of relative TFP levels between France and the United States and the United Kingdom indicate that there does not appear to be a large productivity gap in the manufacturing sector vis-à-vis the United States and that French TFP levels fare considerably better than the United Kingdom for the period under study. A dynamic panel equilibrium-correction model is estimated to explore how R&D, trade, and labor market institutions affect TFP growth and the rate at which the productivity gap is closed between

countries. Preliminary results find the size of the productivity gap to be statistically significant and positively signed, which suggests that sectors that are further behind the technological frontier experience higher rates of productivity growth. R&D and trade with technologically advanced countries have a positive influence on TFP growth but not on the speed of convergence. Finally, results point towards a strong negative relationship between TFP growth and key labor market variables, namely the replacement ratio and the ratio of the minimum wage to median wages.

JEL Classification Numbers: E22, E32, F43

Keywords: Productivity growth, technological convergence, R&D, trade and labor markets, France, United Kingdom, United States

17/ Mahfouz, Selma, 2000, "The French Tax System—Recent developments and Key Issues," IMF Country Report No. 00/148.

France is characterized by one of the highest tax burdens in the industrialized countries, with a ratio of revenue to GDP some 20 percentage points higher than in Japan and the United States, and also above that of other euro area countries. Even though differences in tax burdens partly reflect institutional arrangements (e.g., private versus public pensions and health care), France's high tax burden is widely, and indeed officially, recognized to act as an impediment to sustained growth, notably by discouraging labor supply and investment. Prompted by these concerns, the government announced in late August 2000 a package of tax reductions, which, combined with a number of tax cuts introduced in the 1999 and 2000 budgets, entails a significant reduction in a number of taxes and in the overall tax burden. These measures will help improve labor market performance, allowing a decline in the NAIRU. Still further reforms of the tax-benefit system will be needed to help expand available labor supply. These reforms should focus on reducing disincentives to work, streamlining the income tax system, and ensuring a competitive corporate tax regime.

JEL Classification Numbers: D91, E24, E62, H21

Keywords: Tax burden, labor supply, growth, France

18/ Mottu, Eric, 2003, "Tax Reform and Potential Growth in France," IMF Country Report No. 03/335.

With a view to promoting growth, since 2001, France has reduced personal and corporate income taxes, local business taxes, social security contributions, and introduced a refundable tax credit, but the budgetary room left for further meaningful tax cuts is virtually inexistent. Nonetheless, even a revenue-neutral change in France's tax structure could benefit and foster durable growth. A promising avenue includes: altering the tax structure

away from labor and toward a broader basis, widening the VAT tax base by curtailing the extent of exemptions and reduced rates, cutting corporate and capital taxes and improving their neutrality, and simplifying local taxes.

JEL Classification Numbers: E24, H21, H24

Keywords: Tax reform, VAT, Growth, France

19/ Nadal De Simone, Francisco, 2002, "Common and Idiosyncratic Components of the French Business Cycle," IMF Country Report No. 02/249.

The objective of this study is to dissect the French real GDP cycle into its common and idiosyncratic components. The main finding is that there is a great deal of synchronization between the French cycle and the rest of the world and Europe. The French idiosyncratic component is also significant, albeit smaller than one would have surmised from looking at differences in employment behavior during what has been called "employment-rich growth" in the late 1990s. The analysis suggests that labor market developments and related policies made a difference.

JEL Classification Numbers: C51, E32, F42

Keywords: Common factors, business cycles, international shock transmission, France

20/ Nadal De Simone, Francisco, 2003, "Potential Growth of the French Economy," IMF Country Report No. 03/335.

The recent recovery of French trend growth resulted mostly from an increase in structural employment as well as from capital deepening made possible by investment but also, in a minor way, by enhanced use of shift work. These forces more than offset the decline in total factor productivity growth in the 1990s.

JEL Classification Numbers: E22, E24, E27

Keywords: Potential growth, NAIRU, capital deepening, TFP, France

21/ Nadal De Simone, Francisco, 2005, "Recent French Inflation Behavior: Is it Any Different from the Euro Area?," IMF Country Report No. 05/397.

French headline inflation moved above the euro area average during the last two years. This increase above the euro area average is no reason for concern, as it has been predominantly due to transitory cost-push factors, such as energy prices, indirect taxes, and public sector-related prices, with no evidence of second-round effects thus far. Nonetheless, some price pressure stemming from a buoyant residential real estate market and from labor cost increases in some service sectors was also identified. Results are also presented in less detail

for Germany, Italy, and Spain. As a corollary to the analysis, it is shown that the common component of inflation, extracted with the Generalized Dynamic Factor Model, is a good measure of underlying inflation, for some purposes superior to traditional measures of core inflation.

JEL Classification Numbers: C51, E31, E32

Keywords: Dynamic factor model, inflation, France, euro area

22/ Schule, Werner, 2004, "Household Consumption in France," IMF Country Report No. 04/346.

Household consumption has made a steady contribution to growth in France not only because of its size but also thanks to its resilience with respect to fluctuations in income. Nevertheless, some economists and policy makers in France have argued that consumer spending has been suboptimally low over the past ten years. The focus of this study is on the determinants and short-term outlook of private consumption, approximated by spending on nondurables and services. An estimated error-correction model suggests that private consumption tracks disposable income closely, but that wealth effects are also significant. However, overall wealth effects in France are smaller than in the United States, and the evidence of an impact of nonfinancial assets (predominantly housing) is weak. The evidence with respect to the other factors is mixed: real interest rates and fiscal variables lack significance, or robustness, while the unemployment rate is important for the short-term dynamics of consumption, but not for its trend. The acceleration of private consumption since the second half of 2003 is compatible with the predictions of the estimated equation. Consumers seem to be catching up on delayed spending, bringing household spending back toward its long-term equilibrium path. While the gap between measured and perceived inflation has not yet narrowed significantly, uncertainty has diminished with the economic recovery and the implementation of pension and health care reforms, and income support and wage increases at the bottom of the income distribution have buttressed the short-run propensity to consume. Finally, the stock market recovery and the strong housing market are boosting wealth, raising the long-run equilibrium consumption path. Nevertheless, to attain this higher path, it will be necessary to improve the working of consumer credit markets to raise the degree of spendability of housing wealth and strengthen confidence through the pursuit of growth-oriented structural reforms.

JEL Classification Numbers: E21, E27

Keywords: Household consumption, wealth effects, housing, France

23/ Schule, Werner, 2005, “Estimating the Macroeconomic Effects of Higher Competition in Labor and Product Markets,” IMF Country Report No. 05/397.

Greater competition would reduce markups in goods and labor markets, lower prices, and increase output and employment. The Fund’s global economic model (GEM) is used here to quantify the macroeconomic effects of increasing competition in France and the euro area. Simulations of the effects of lowering markups in product and labor markets show large gains in GDP, employment, and consumption, once the adjustment is completed. The dynamic adjustment paths following reforms in labor, services (nontradables), and goods (tradables) markets illustrate the advantages of exploiting reform complementarities across markets and the gains of coordinating structural reform among euro area countries.

JEL Classification Numbers: E10, F41, F42, F43

Keywords: Structural reform, trade, policy coordination, France, euro area, EU

24/ Ubide-Querol, Angel, 2000, “Measures of Slack in the French Economy,” IMF Staff Country Report No. 00/148.

Three different approaches to measure the amount of available slack in an economy are applied: statistical identification, economic identification, and survey-based measures of slack. A comparison of these alternatives reveals that the evolution of the NAIRU is crucial for understanding recent cyclical developments in the French economy. Following the cyclical trough in 1993, activity recovered timidly in 1994–96 but then accelerated. Since 1997, unemployment has declined by almost 3 percentage points while inflation has averaged less than 1 percent and wage growth has been contained: labor market and tax reforms have arguably reduced the NAIRU and raised potential. At this cyclical juncture, it becomes both more difficult and more important to gauge the amount of slack remaining in the economy.

JEL Classification Numbers: E22, E32, J23

Keywords: Output gap, NAIRU, labor market and tax reform, France

25/ Weisfeld, Hans, 2002, “Explaining Inflation With the Help of the New Keynesian Phillips Curve,” IMF Country Report No. 02/249.

Wage moderation exerted a dampening effect on inflation, permitting France to post one of the lowest records on inflation during the 1990s. Inflation appears to be well explained by a hybrid neo-Keynesian Phillips curve, in which marginal costs—and thus wage and productivity behavior—play a key role. The recent uptick in inflation can thus partly be attributed to a slight acceleration of wage growth.

JEL Classification Numbers: E24, E31

Keywords: Wage moderation, Phillips curve, inflation, France

26/ Zhou, Jianping, 2005, “Employment Protection and Unemployment in France,” IMF Country Report No. 05/397.

Unemployment has remained high in France for the last two decades, despite some improvements during the late 1990s. Recent studies suggest that reform of employment protection legislation is needed to enhance job creation. A number of recent reports, some sponsored by the government, offer various reform proposals. This paper analyzes the unemployment effects of these reform proposals, with a view to assessing the effectiveness of the CNE contract in promoting job creation and reducing the structural unemployment rate. It uses a search-matching model with hiring and firing restrictions to identify the channels through which changes in employment protection legislation (EPL) affect hiring and firing decisions and aggregate labor market variables such as unemployment. This approach recognizes the frictions and imperfect information that exist in labor markets.

JEL Classification Numbers: J23, J41, J64

Keywords: Unemployment, job creation, fixed-duration contracts, employment protection, search-matching model

27/ Zhou, Jianping, 2006a, “Reforming Employment Protection Legislation in France,” IMF Working Paper No. 6/108.

Over the last 15 years, the reforms of employment protection legislation (EPL) in European countries have mainly eased hiring and firing restrictions for temporary employment while leaving the strict EPL provisions for regular or permanent contracts unchanged. Recent reforms in France follow this pattern. Using a search-matching model, we argue that this type of partial reform is inefficient: easing restrictions on temporary jobs fosters both job creation and job destruction, but strict EPL discourages both. The overall impact on equilibrium unemployment is thus ambiguous, depending on the characteristics of the

specific labor market. Simulations of the model, calibrated for the French labor market, suggest that the job destruction effect is stronger, thus raising the unemployment rate.

JEL Classification Numbers: J23, J41, J64

Keywords: Unemployment, job creation, fixed-duration contracts, employment protection, search-matching model

28/ Zhou, Jianping, 2006b, “Danish for All? Balancing Flexibility with Security: The Danish Flexicurity Model,” (forthcoming).

While there is increasing recognition in European countries that flexible labor markets are necessary to reduce unemployment, labor market reforms are often confronted with strong political opposition, for fear that they would lead to a significant erosion of job and income security. The Danish flexicurity model has thus attracted attention among policymakers in Europe, because it suggests that a flexible labor market can coexist with a generous welfare system to achieve one of the lowest unemployment rates in Europe. Using a panel consisting of 19 countries over the period 1960–2002, the paper identifies the elements of the flexicurity model that may have contributed to the decline in the Danish unemployment rate. A theoretical model of dynamic policies is used to analyze whether the Danish flexicurity model can be emulated by other European countries. Focusing on the financing aspect of the flexicurity model (i.e., the high tax wedge on labor income), the paper argues that the implementation will depend on the initial unemployment level and budget situation of the country. Simulations based on the calibrated model for France suggest that implementing the flexicurity model in France is costly, with limited reduction in structural unemployment.

JEL Classification Numbers: E24, I38, J23,

Keywords: Danish flexicurity model, structural unemployment, welfare state, France, EU