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Recent French Export Performance: Is There a Competitiveness Problem?

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IMF Working Paper

European Department

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Abstract

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Recently, the export performance of France relative to its own past and relative to a major trading partner, Germany, deteriorated. That deterioration seems related to the geographical destination and product composition of trend exports. Faced with an increase in unit labor costs or in its terms of trade, France adjusts relatively less via price and wage changes, and more via employment changes. Given that SMIC convergence resulted in a significant increase in unit labor costs, foreign sector difficulties might be structural. Trade flows relevance and euro area policy constraints highlight the importance of structural reforms that increase markets flexibility.

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I. INTRODUCTION

Evidence shows that a significant part of French activity fluctuations has a foreign source (e.g., Kose, Otrok, and Whiteman, 2003; and Kabundi and Nadal De Simone, 2007). In particular, since 2000, French foreign sector performance has experienced a substantial deterioration vis-à-vis its own past and relative to Germany. Some observers have suggested that the country has not benefited fully from the opportunities offered by the rapid economic performance of emerging Asian economies and the eastward expansion of the European Union (EU). Therefore, the question arises as to whether France is suffering from a competitiveness problem. This question has had, so far, an elusive answer. Traditional variables that explain international trade, such as the exchange rate, relative unit labor costs, and demand pressure seem insufficient to illuminate the recent decline in France's export performance. Residuals from econometrically-estimated equations indicate a substantial drag on exports since 2001, not attributable to the standard global demand and price/cost factors.³

In addition, equilibrium exchange rate analysis indicates that France's real effective exchange rate is largely in line with fundamentals. National account data show, however, that changes in export margins have cushioned the effects of the euro fluctuations. Cost competitiveness of French producers worsened in 2005 and early 2006, though it remains in line with its long-term average. Despite that producers lowered export prices in euros to maintain price competitiveness, the external position deteriorated during the period.

Hence, the relative underperformance of exports in past years may point to structural factors that leave French firms behind the global expansion. A more flexible economy should be able to reorient the destination of its exports and product mix toward fast-growing economies and sectors. Indeed, a sectoral study of total factor productivity (TFP) growth in manufacturing found that, while France does not lag significantly behind the United States in terms of level, TFP growth is hampered by the high ratio of minimum to median wages.⁴ Staff analysis also suggests that as France has become more sensitive to the global economy over time, it has tended to adjust more through changes in employment and productivity than through wage flexibility, strengthening the case for more structural reforms.⁵

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³ See IMF, 2005.

⁴ See Khan, 2006.

⁵ See Kabundi and Nadal De Simone, 2007.

This paper performs a descriptive analysis of French export data by destination and by SITC product classification distinguishing between the cyclical and the trend components of the series. Next, it analyzes the behavior of prices and quantities following a domestic and a foreign shock to the French economy; the paper contrasts and compares the reaction of French and German variables to shocks to unit labor costs and to terms of trade.

Globalization has greatly influenced economies over the past three decades. Countries' boundaries have dropped through intensive trade of goods and services, and financial integration. Economies have benefited from trade and foreign direct investment (FDI). Conversely, globalization can make countries more vulnerable to external shocks. Crises can be severe and contagion can spread rapidly to other parts of the globe, as recently exemplified by the subprime crisis that started in the United States.

There is a consensus in the literature that globalization has largely positive effects. Globalization fosters comovement of macroeconomic variables across countries through trade integration and financial market integration (IMF, 2001; and Imbs, 2004). An increase in exports in one country boosts economic activity of the recipient country (Canova and Dellas, 1993; and IMF, 2001). Such spillover effects lead to high correlation of business cycles.

The integration of financial markets has also contributed to the synchronization of business cycles through the opening of countries' capital accounts. Financial prices have become more synchronized through arbitrage (e.g., the global slowdown of 2000–01 was caused by the crash of the technology stock market in the United States). Financial comovements tend to be substantially larger than comovements in the real economy, and financial comovement has increased for financial markets over time (Brooks, Forbes, and Mody, 2003).

On the empirical front, most findings show increasing synchronization of economic variables across countries. Kose, Otrok, and Whiteman (2005), using the Bayesian dynamic factor model, extract common components in output, consumption, and investment and find that the degree of synchronization of business cycles of major macroeconomic aggregates across G-7 countries has increased over time. On the nature of shocks that drive the comovement, they find that oil-price shocks are behind synchronization of cycles during the “common shocks” period. Nadal-De Simone (2002), using a concordance index proposed by Harding and Pagan (2002) and the dynamic factor model of Stock and Watson (1991), finds evidence of a global component as well as a regional component that explains the comovement between European economies themselves and with the United States. In the same vein, Monfort and others (2004); Kose, Otrok, and Whiteman (2003); Malek Mansour (2003); Yang (2003); Lumsdaine and Prasad (2003); Bordo and Helbling (2004); and Canova, Ciccarelli, and Ortega (2007) support the view that fluctuations of most macroeconomic variables across developed countries are mainly driven by a global factor.

In contrast, Kose and Yi (2006); Kose, Prasad, and Terrones (2003); Stock and Watson (2003); and Heitz, Hild, and Monfort (2004) find that G-7 business cycles have become less synchronized. A possible reason is that trade flows could lead to increased specialization resulting in changes in the nature of business cycles. Trade ties are closely related to a rise in inter-industry specialization across nations, and then industry-specific shocks are the main driving forces of business cycles. Synchronization may be thus reduced. Similarly, international financial linkages could also stimulate production through the reallocation of capital in a manner consistent with countries' comparative advantage (Imbs, 2004), which in turn reduces business cycle synchronization.

Other studies have emphasized the sources of shocks, their spillovers, and channels of their transmission. Recent examples include the study of the monetary transmission mechanism in the euro area using structural VAR analysis by Peersman (2005); Canova, Ciccarelli, and Ortega (2007); and Ciccarelli and Rebucci (2006). Similarly, Canova and Ciccarelli (2006), using a VAR with time-varying parameters, find a positive and significant effect of U.S. GDP growth shock on France and Italy, but a negligible effect on German GDP growth. Canova (2005) uses a structural VAR approach and finds that U.S. monetary shocks have a strong influence, while real supply and demand shocks have a minor effect. Given the limitations of the VAR methodology—the most conspicuous being that it cannot accommodate a large panel of series without the risk of running short of degrees of freedom—Stock and Watson (1998 and 2002) use the approximate structural dynamic factor model on a large panel of developed countries' variables. Like Kabundi and Nadal De Simone (2007) and Eickmeier (2007), find a positive and significant effect of U.S. demand shocks on French and German output, while EU supply shocks tend to have important effects on French and German output.

The high degree of integration, and with it the exposure of countries to shocks, stresses the importance of good and factor markets flexibility. Economies' flexibility to absorb domestic and foreign origin shocks takes paramount importance, even more so when countries' policy menu is restricted in some sense such as by participation in a currency area. Not surprisingly, competitiveness issues have been taken to the front line of the economic and political debate.

This study contains several findings. (1) Divergences in recent trade performance between France and Germany are not related to the cyclical part of trade but to its trend. (2) For most categories of products, France's export cyclical component is less volatile than Germany's. (3) In the 2000s, France's trend export growth rate while higher than in the 1990s, was less than 60 percent Germany's. (4) Both France and Germany faced a negative common factor in the 2000s, most likely due to the euro appreciation. (5) However, idiosyncratic factors were negative on average for France and positive for Germany. (6) The French economy seems less flexible to adjust to a negative shock to unit labor costs in manufacturing or to its terms of trade: the adjustment tends to be done relatively more via quantities than via prices suggesting the need to make labor and product markets as flexible as possible.

Section II discusses the data and elaborates on the methodology to deal with non-stationarity in the data. Section III describes the cyclical and trend components of French exports by destination and by product. Section IV analyzes the response of the French economy to a shock to unit labor costs in manufacturing and to the terms of trade. Section V discusses the policy implications of the study.

II. DATA AND NON-STATIONARITY

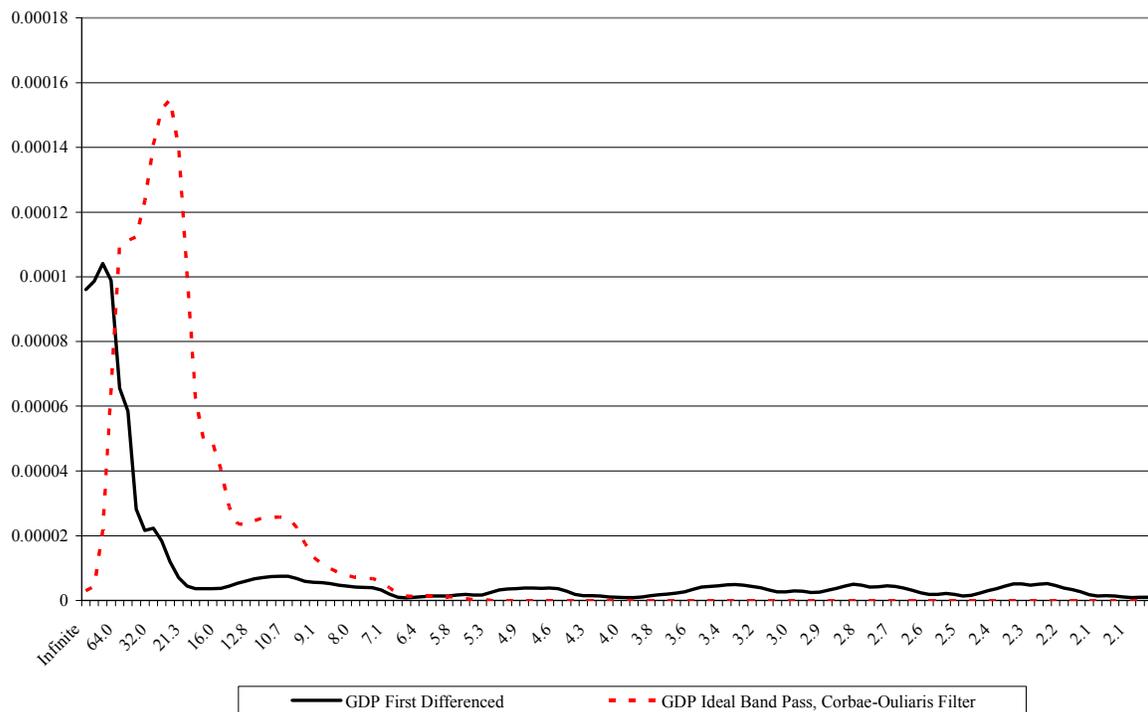
A. Data

This study uses two large data panels. The first one comprises 396 quarterly macroeconomic series and 106 Direction of Trade (DOT) series of trade by country (for a total of series $N = 502$). DOT series include imports and exports to the euro area, the EU, Ascension countries, Canada, the United States, the United Kingdom, Japan, China, Asia, Latin America, and the rest of the world. The second data panel contains 396 quarterly macroeconomic series and 110 series of trade by SITC Revision 3 category of products (for a total of series $N = 506$). The sample period is 1981:Q1–2006:Q4, or 104 observations for the two data panels (i.e., $T = 104$). The countries included in the sample are France, Germany, Japan, the Netherlands, 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, a commodity industrial inputs price index, world demand, and world reserves. 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. All variables have had their seasonal component removed. The complete list of variables used in this study is in Annex I.

B. Dealing with Non-Stationarity

For estimation purposes, series have to be covariance stationary. Instead of applying unit root tests to determine the degree of integration of the series and then difference or detrend them depending on whether they are $I(1)$ or $I(0)$ with a deterministic trend, respectively, the Corbae-Ouliaris Ideal Band-Pass Filter was used. See Appendix I for a technical description of the filter. The reason for this approach is twofold. First, as is well known, currently available unit root tests have low power and often the decision on the degree of integration of the series has to be based on subjective judgment. Second, it is also known that first differencing removes a significant part of the variance of economic time series. Third, the ideal band-pass filter of Corbae and Ouliaris is consistent, is not subject to end-point problems and has no finite sampling error. As an illustration of these points, note the large share of variance that first differencing of French real GDP produces at the business cycle frequency band (between 6 and 32 quarters, according to the NBER definition of business cycles) (text figure).

France: Spectra of Real GDP Filtered
(Y axis: spectrum; X axis: periodicities in quarters)



III. DESCRIPTIVE PART: FACTS WITHOUT THE NOISE

Several interesting features of recent French export performance are clear from the data once the noise of short-term fluctuations is removed. First, the cyclical components of exports by country and products of France and Germany follow the same pattern, mimicking quite closely their business cycles (Figure 1). Export cycles of both countries portray a picture of negative growth in the early 1980s and 1990s, and at the end of the 1990s. The U.S. driven early-1980s recession, the European 1993 recession and the end of the stock market “bubble” at the end of the 1990s are clearly correlated to exports behavior (IMF, 2005). But, in general, France’s export cyclical component is less volatile than Germany’s, which may be associated with the product composition of both countries exports; German exports products have a higher short-term elasticity. Hence, divergences in recent trade performance between France and Germany do not seem to be related to the cyclical part of trade flows. What about the trend in trade flows?

Figure 2 shows annual trend growth of exports. Looking at exports by destination, it seems that Germany has benefited more from the excellent economic performance of China than France. Starting in 2002–03, French export performance is also weak relative to Germany in terms of exports to the EU, the euro area, the United States, and the United Kingdom. France’s export performance is also weaker relative to its own past. In the 1980s, French

trend export growth dominated Germany's only with respect to China; the reverse was true in the 1990s (Table 1). In the 2000s, France's trend export growth rate, while higher than in the 1990s, was less than 60 percent of Germany's.

The deterioration of French export performance vis-à-vis its own past and relative to Germany can be related to products exported. In the 1980s, French trend export growth dominated Germany's in primary products, chemicals, and miscellaneous manufactured products; the situation was almost the opposite in the 1990s. In the 2000s, of the traditional French exports, France's trend export growth rate was higher than Germany's only in chemicals and "other" goods.

The analysis of trend growth rates suggests that there has been since 2002–03 a clear underperformance of French exports relative to the past and also relative to Germany. That France seems less competitive in recent years does not seem to be related to the euro; France's underperformance is quite broad from a product viewpoint. The change in export performance is relatively recent, but has been protracted enough so as to raise the question of the competitiveness of the French economy. More analysis and time is needed, however, to conclude that there is a structural issue.

IV. ANALYTICAL PART: ULCM AND TOT SHOCKS

A. The Model and Economic Conditions for Shocks Identification

To gain further insight into the possible causes of the deteriorating performance of the French foreign sector, this study uses a large dimensional approximate dynamic factor model following the static factor model of Stock and Watson (1998 and 2002).⁶ The methodology for estimating of the model comprises two main steps. First, estimating the common components of a large panel of data, and second, identifying a reduced number of structural shocks that explain the common components of the variables of interest.⁷ Once a decision is taken on the process followed by the common components, structural shocks have to be identified. The identification of structural shocks is achieved by focusing on the reduced form VAR residuals. Following Eickmeier (2007), the identification scheme has three steps. First, maximize the variance of the forecast error of the chosen variable and calculate impulse-response functions. Second, the identified shocks are assumed to be linearly correlated to a vector of fundamentals. Finally, orthogonal shocks are identified by rotation using a sign-identification strategy imposing inequality restrictions on the impulse-response

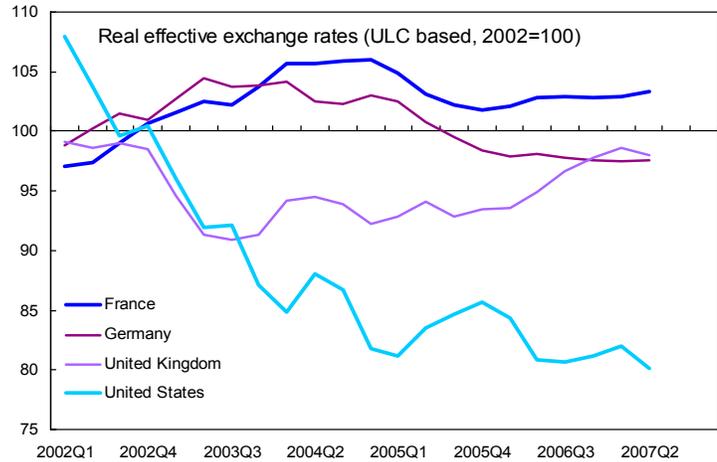
⁶ This model is closely related to the traditional factor models of Sargent and Sims (1977) and Geweke (1977), except that it admits the possibility of serial correlation and weakly cross-sectional correlation of idiosyncratic components, as in Chamberlain (1983) and Chamberlain and Rothschild (1983). Similar models have recently been used by Giannone, Reichlin, and Sala (2002), Forni and others (2005), and Eickmeier (2007).

⁷ See Appendix II for a technical description. See also Kabundi and Nadal De Simone (2007).

functions of variables based on a typical aggregate demand/aggregate supply framework.⁸ Only those rotations among all possible rotations that have a structural meaning are chosen.

The choice of the variables of interest was motivated by two observations. First, France economic activity is largely influenced by developments in the rest of the world. Thus, it seemed natural to identify a terms of trade (TOT) shock to contrast and compare the behavior of France relative to Germany. Second, in the period of concern, only using unit labor cost measures of the REER, can be seen that French competitiveness deteriorated against

Germany in the euro area, although it improved against some other countries. Wages have increased faster in France particularly at the bottom of the scale; these increases have been only partially compensated by higher productivity growth (text figure). Therefore, the second shock that was identified was a shock to unit labor costs in manufacturing (ULCM). The choice seemed also relevant in view of the results of the previous section.



The text table displays the sign restrictions for the identification of shocks that are imposed contemporaneously and during the first year after the shock.

As in major standard macroeconomic models, an increase in ULCM can be interpreted as the result of a fall in labor productivity or an increase in labor compensation. The former is going to be interpreted as a supply shock and the later as a demand shock. This is consistent with the empirical observation that real wages are procyclical. Similarly, a rise in the TOT can result from a deterioration of the country's competitiveness related to structural factors or alternatively from strong world demand for the country's products. If the shock is persistent, it will result in an increase in consumption (and

	Identification Inequalities	
	Increase in ULCM	
	Supply shock	Demand shock
ULCM	≥ 0	≥ 0
Output	≤ 0	≥ 0
Real wages	≤ 0	≥ 0
	Increase in Terms of Trade	
	Supply shock	Demand shock
Terms of trade	≥ 0	≥ 0
Consumption	≥ 0	≤ 0
Current account	≤ 0	≥ 0

⁸ See Peersman (2005) for more technical details.

investment) and the current account will move into deficit. In contrast, if the TOT increase is due to strong world demand for the small country's products, given the transient nature of the shock, consumers will largely save the windfall and the current account will move into surplus. Savings will increase.

B. Estimation

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.⁹ Using Bai and Ng's (2002) selection criteria, four 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.

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 nature and source of shocks. 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 (2007), this paper does not restrict the impact effect of the shock. Moreover, after identifying two shocks and giving them an economic interpretation, this study performs the same analysis on a data set containing *only* French variables. It finds that the impulse-responses of the French-only data set and the broader data set are similar, bringing thus further comfort as to the identification of the source of the shocks.

As it is well known in the literature, only two structural shocks could be identified for each variable of interest. The identification procedure proposed by Uhlig (2003) was applied to the common components of France and Germany's ULCM and TOT so as to find a reduced number of structural shocks that maximizes the explanation of its forecast error variance over 20 periods.

Sign restrictions on impulse response functions were used to provide economic meaning to the structural shocks. Following Peersman (2005), the angle rotations were applied to the first two principal component shocks taking as pairs a supply shock and a demand shock. The bootstrap was made up of 500 draws.¹⁰ The impulse-response functions are calculated for the

⁹ 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.

¹⁰ The identification of the shocks never required more than 530 draws.

first five years to display the cyclical pattern associated with the structural shocks. Both the median response and a 90 percent bootstrapped confidence band are estimated.

Two final points on identification are necessary. First, 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 ULCM and TOT. Second, the impulse-response functions from a dataset containing only French variables were similar to those of the full sample, especially the supply shocks.

V. ECONOMETRIC RESULTS

Results are presented in the form of variance decomposition and impulse-response functions. Tables 3 and 4 show the variance decomposition and the forecast error variance of the common components (henceforth, error variance) of French and German variables explained by the two identified shocks to ULCM. Tables 5 and 6 show the same results for the two shocks to TOT. Figures in Annex II show the impulse-response functions of the French and German shocks to ULCM and TOT and their impact on French and German variables. These shocks suffice to explain up to 99 percent of the error variance of the common components of French and German ULCM over 20 quarters; similarly, these shocks explain up to 97 percent and 99 percent of the error variance of the common component of France and Germany TOT over 20 quarters, respectively. The variance shares of ULCM common components are high as they reach about 75 percent for both countries. In contrast, the variance shares of TOT are much smaller, especially for France: up to 10 percent and 42 percent for France and Germany, respectively. The latter suggests that France's TOT are more influenced than Germany's by idiosyncratic factors. This is consistent with Kabundi and Nadal De Simone (2007) results: the TOT play a relatively lower role as channels of transmission of international disturbances in France than in Germany.

The demand shocks to ULCM and TOT are relatively more important than supply shocks for both countries. Supply and demand shocks have qualitatively broadly similar responses in France and in Germany. However, the quantitative effects as well as the adjustment process are significantly different.

In both countries, supply shocks to ULCM reduce output, private consumption, investment and the volume of exports of goods and services. Employment falls, despite some downward adjustment of real wages. The real exchange rate appreciates. The consumer price index, however, clearly falls in Germany while it is flat in France. The impulse-response functions show that the negative effect on output and on the volume of exports and employment of supply shocks is larger in France than in Germany (there seems to be a relatively larger downward rigidity of wages in France). The SMIC has a tendency to rise somewhat despite the fall in labor productivity. While the dollar value of exports to all destinations increases in Germany, this is not the case in France (e.g., exports to the United States clearly fall). The total increase in the dollar value of French exports is half that of German exports. The same

results are evident in terms of the euro value of exports per product, especially for manufactures, transport equipment and mineral fuels and lubricants. France's euro value of exports is larger than Germany's for beverages and tobacco, animal and vegetable oils, and commodities and transactions n.e.c. Therefore, France adjusts relatively less via price and wage changes, and more via employment changes than Germany.

Demand shocks to ULCM affect France and Germany differently. A demand shock to ULCM in France produces a short-term small increase in output while employment, real wages and the consumer price index rise without denting productivity. Exports volume tends to increase somewhat while the real exchange rate tends to depreciate. However, as productivity declines, the process is reversed. The value of exports to all destinations and for all products falls. In Germany, the same shock has a much shorter positive impact on output and employment, i.e., less than a year. The consumer price index increases much less than in France; the real wage increase is short lived and gets undone already after 1½ years. Exports volume decrease and the real exchange rate appreciates. The value of exports is not much affected. So, when ULCM increase due to demand pressures, the German economy adjusts more rapidly and seems to display less cost inertia. The real exchange rate helps to offset the negative effects on output and exports while in the case of France it magnifies them.

TOT shocks affect France less than Germany and that difference is more marked following a demand shock than following a supply shock. Positive supply shocks to TOT increase output, investment, and the volume of exports of goods and services. Employment rises, but in France it does so only after real wages have fallen somewhat, given that labor productivity does not change much. In Germany, employment rises sooner and more than in France; the German increase in labor productivity is relatively larger and offsets the rise in real wages enough so that ULCM fall. The real exchange rate depreciation is similar in both economies in the medium run, but it takes longer to reach that level in France than in Germany. The consumer price index falls somewhat in France and is flat in Germany. The dollar value of exports to all destinations has a tendency to fall in France, but the fall is more pronounced in Germany due to the larger short-run exchange rate depreciation experienced by the economy. Exports by product in euros show no major clear patterns, but there is in general a slight increase. Summarizing the results, supply shocks that increase the terms of trade are more consistent with a persistent supply shock in Germany than in France.

Positive demand shocks to TOT result in a negative output effect in France and are clearly inflationary. The real effective exchange rate appreciates as productivity falls and ULCM rise. The SMIC rises despite the fall in labor productivity. The dollar value of French exports by destination increases, except the value of exports to the United States and to accession countries. The increase is, however, larger for Germany, except in terms of exports to China. The euro value of French exports increases less than German exports. In fact, France's exports are largely flat, except for crude materials, animal and vegetable oils, chemicals and commodities and transactions n.e.c. Overall, the results suggest that the French economy adapts less quickly to inflationary pressures on TOT as a result of a world demand.

A. The 1990s Until Today

The variance shares of ULCM and TOT remain basically the same for France, i.e., around 73 and 10 percent, respectively, during the shorter sample covering the period 1993–2006 (Table 7). The demand shocks to ULCM and TOT are still more significant than supply shocks. The relative importance of the channels of transmission changed. The variance shares of labor productivity and total factor productivity doubled; the variance shares of real compensation of employees, employment, and the SMIC also increased, while the share of consumer prices fell. The results suggest that most variables (except the price level) have become less influenced by idiosyncratic factors. In addition, the error variances indicate that in the recent sample, the role of demand shocks has increased. Similarly, the fall in the variance share of exports from 81 percent to 70 percent suggests that the foreign sector idiosyncratic factors play a more significant role in recent times, a result consistent with the analysis above.

The relative more predominant role played by French idiosyncratic factors becomes more obvious when France is compared with Germany. Germany had an increase in the variance share of ULCM and a slight decrease in the variance share of TOT. However, the price level, real compensation of employees, and productivity remained basically unchanged indicating that the role of idiosyncratic factors did not change despite reunification. Idiosyncratic factors have become more relevant for Germany in terms of the real effective exchange rate, as illustrated by a decline in its variance share. In contrast to France, German exports variance share increased significantly in the more recent period suggesting a more important role for common factors. Like for France, German demand shocks outweigh supply shocks.

VI. CONCLUSION AND POLICY IMPLICATIONS

French economic activity is significantly affected by economic activity in the rest of the world. One key channel for the transmission of shocks across countries is international trade. In recent years, the export performance of the French economy relative of its own past and relative to a major trading partner, Germany, has deteriorated. Therefore, the question arises as to whether France is suffering from a competitiveness problem. So far, traditional variables explaining international trade have proved to be insufficient to elucidate the recent decline in France's export performance. Residuals from econometrically-estimated equations indicate a substantial drag on exports since 2001–02, not attributable to the standard global demand and price/cost factors. In addition, equilibrium exchange rate analysis indicates that France's real effective exchange rate is largely in line with fundamentals.

This study has found that the recent deterioration of French export performance does not seem to be related to the "cycle" but to the trend growth of exports, which seems lower in the early 2000s than it was in the past. France's weaker export performance in the 2000s is reflected both in terms of geographical destination and in terms of product composition.

Given the exposure of the French economy to the rest of the world as well as the known asymmetry in the transmission of disturbances, it was natural to analyze the response of the French economy to typical domestic and foreign shocks. The analysis of the effects of an increase in unit labor costs in manufacturing and of an increase in the terms of trade, suggests that the French economy is relatively less flexible to adjust than the German economy. Faced with an upward shift in unit labor costs, France adjusts relatively less via price and wage changes, and more via employment changes. The same differences are also evident when both countries are faced with an upward TOT shock. To the extent that the convergence of the SMIC operated between 2003 and 2006 represented a significant increase in unit labor costs, and to the extent that the country is a price taker in most of its exports, the study supports the view that the difficulties observed in the French foreign sector may be structural.

The importance of trade flows and relative price changes in the international transmission of disturbances—as well as the policy constraints imposed by the euro area—highlight the relevance of domestic price flexibility. The French economy would benefit from further structural reforms that increase its good, service, and labor markets' flexibility. 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, the analysis highlights the importance of measures that increase productivity and, in particular, the desirability of avoiding SMIC adjustments unrelated to productivity.

Figure 1. Cyclical Part

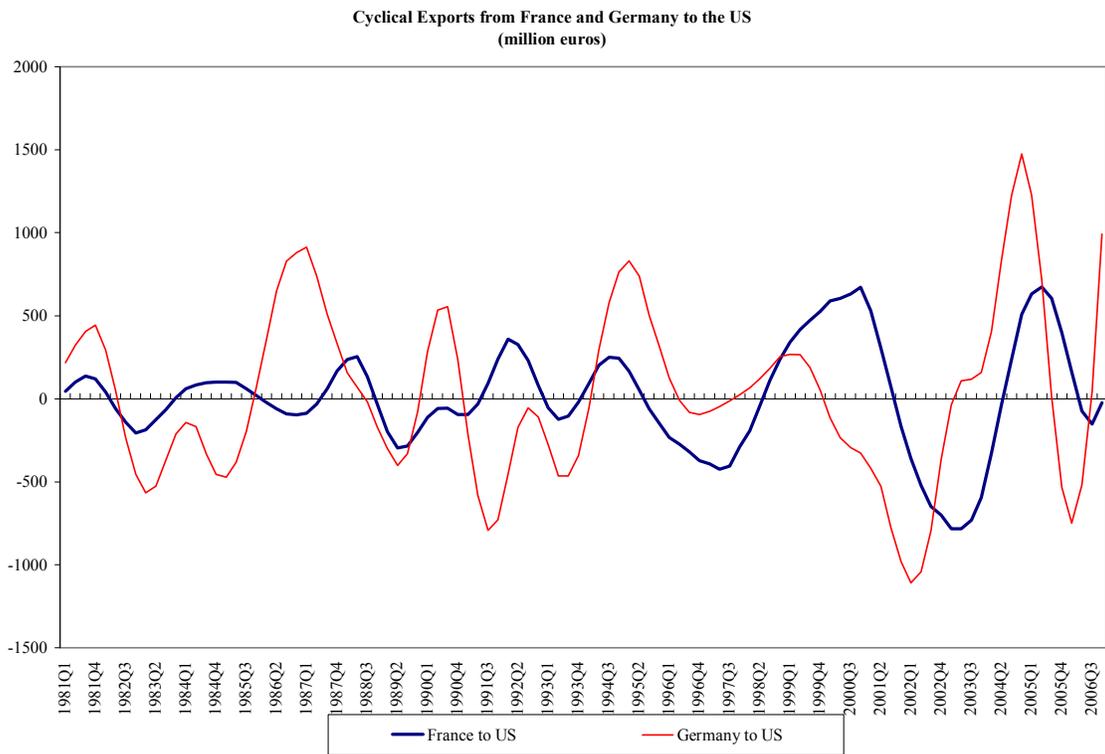
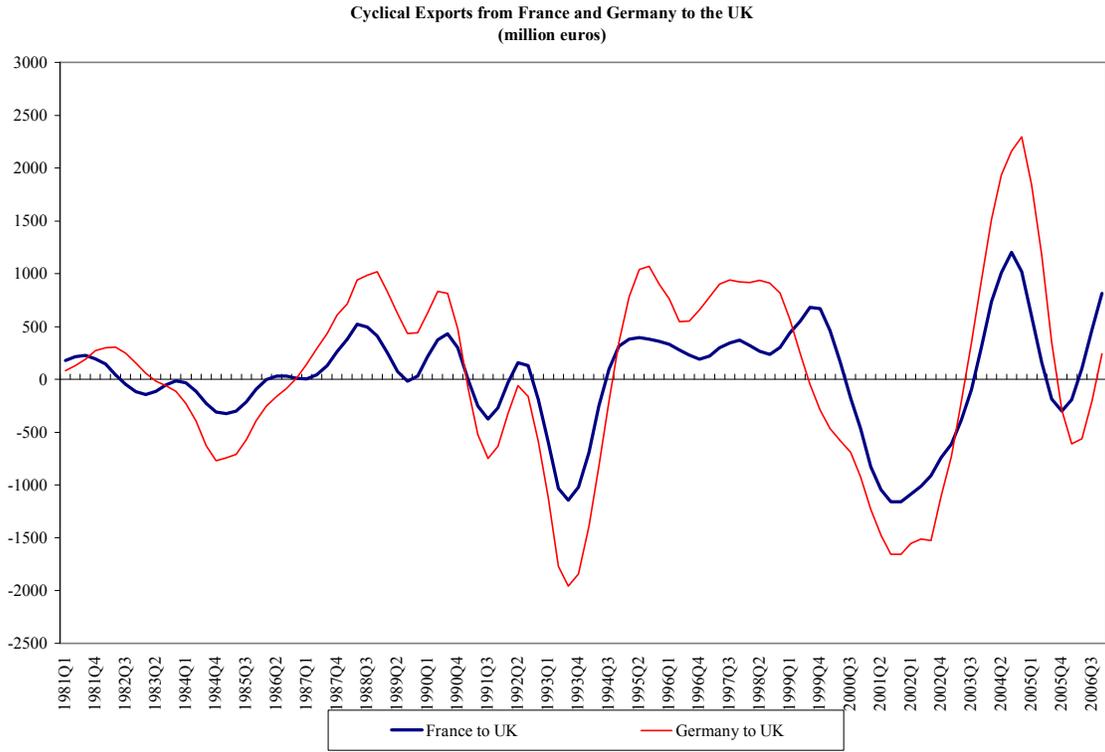


Figure 1. Cyclical Part (continued)

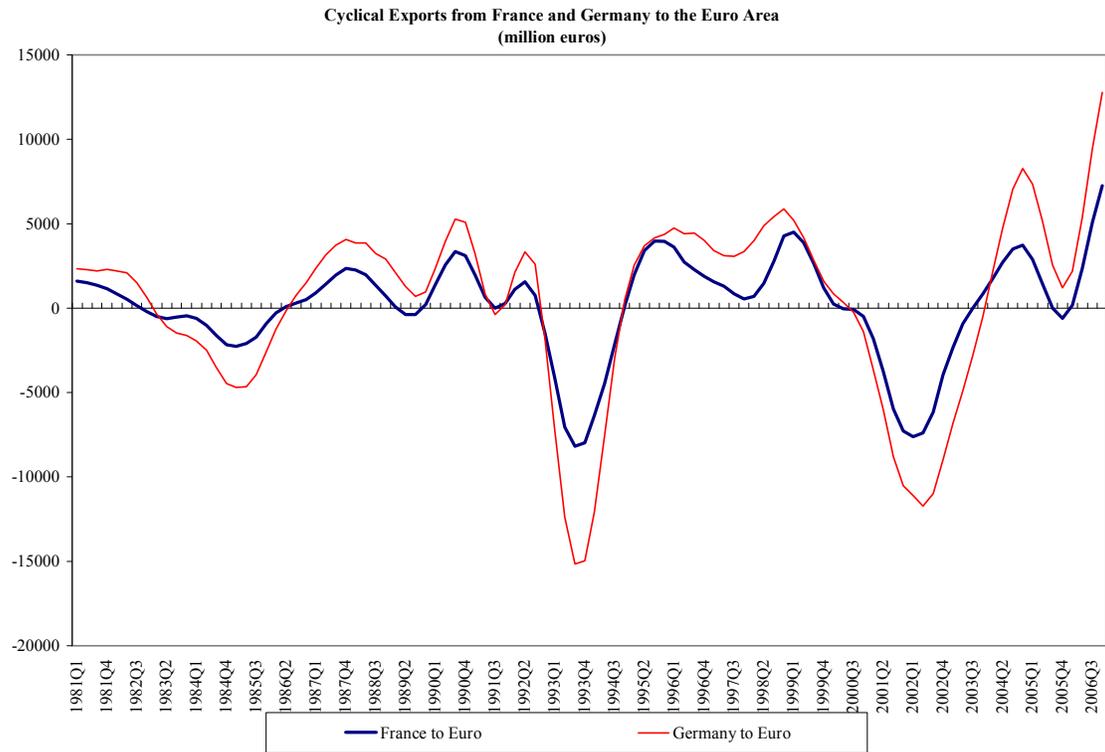
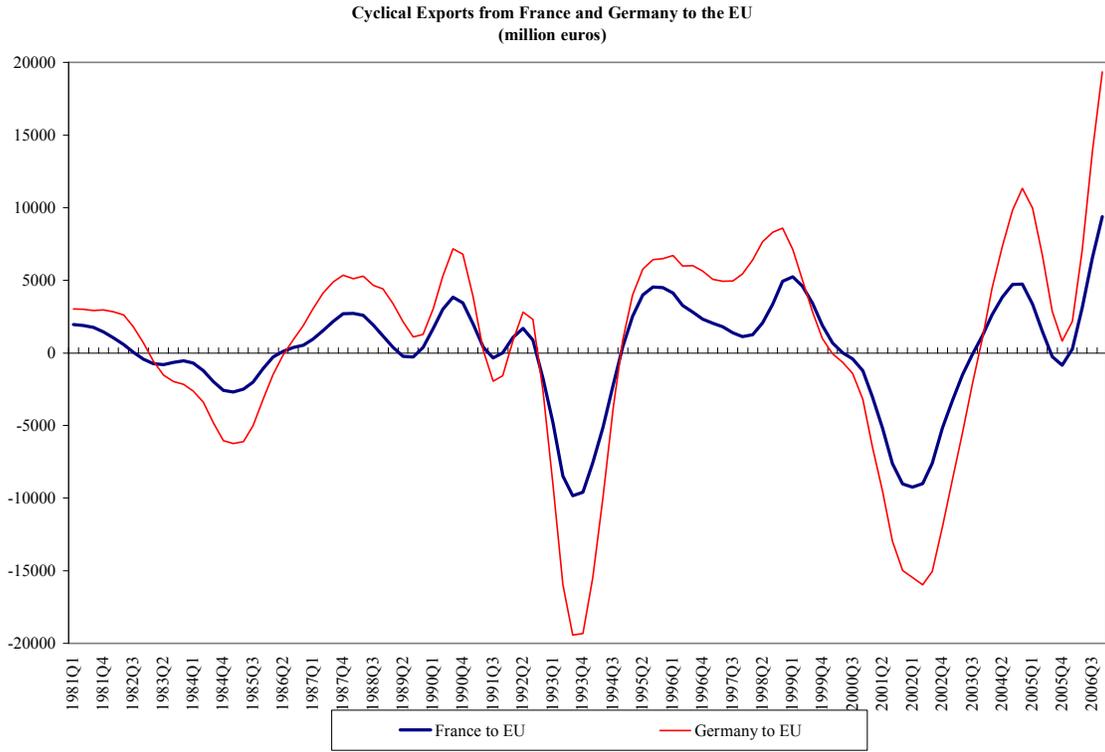


Figure 1. Cyclical Part (concluded)

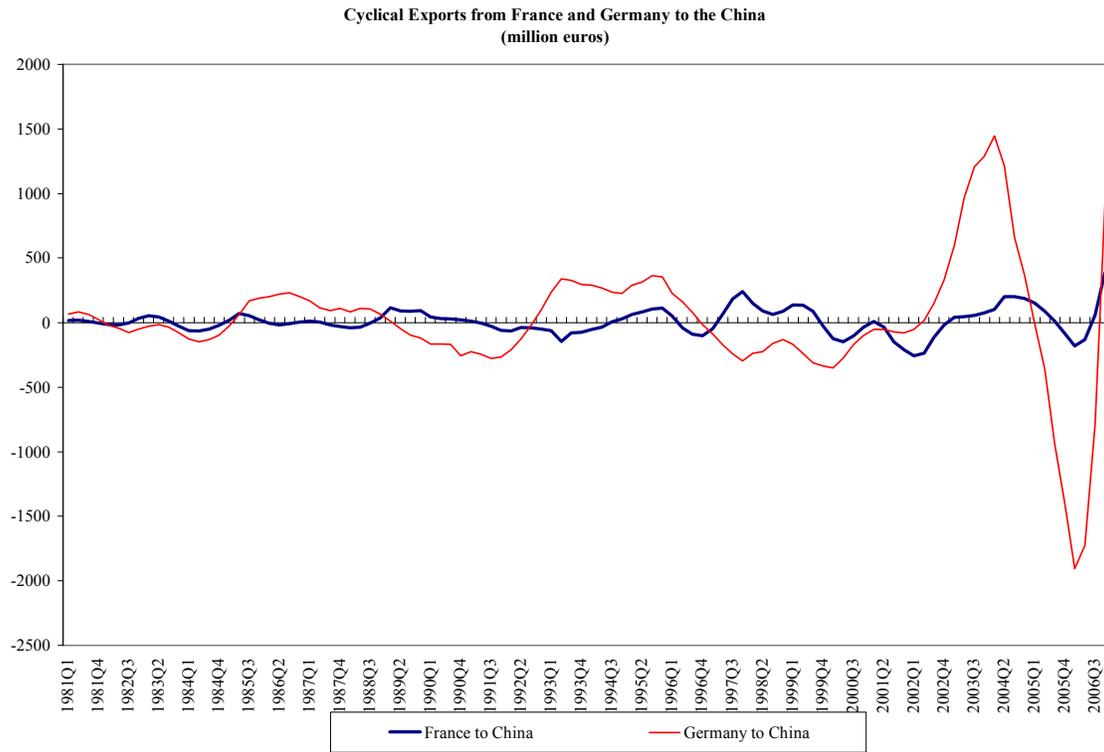


Figure 2. Trend Part

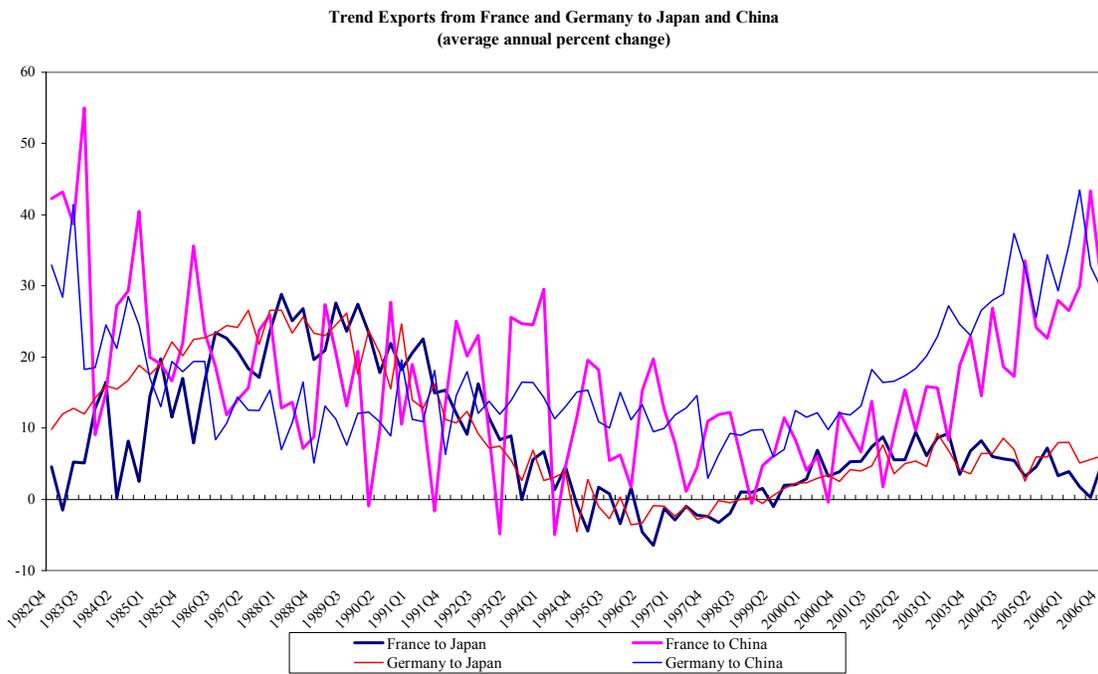
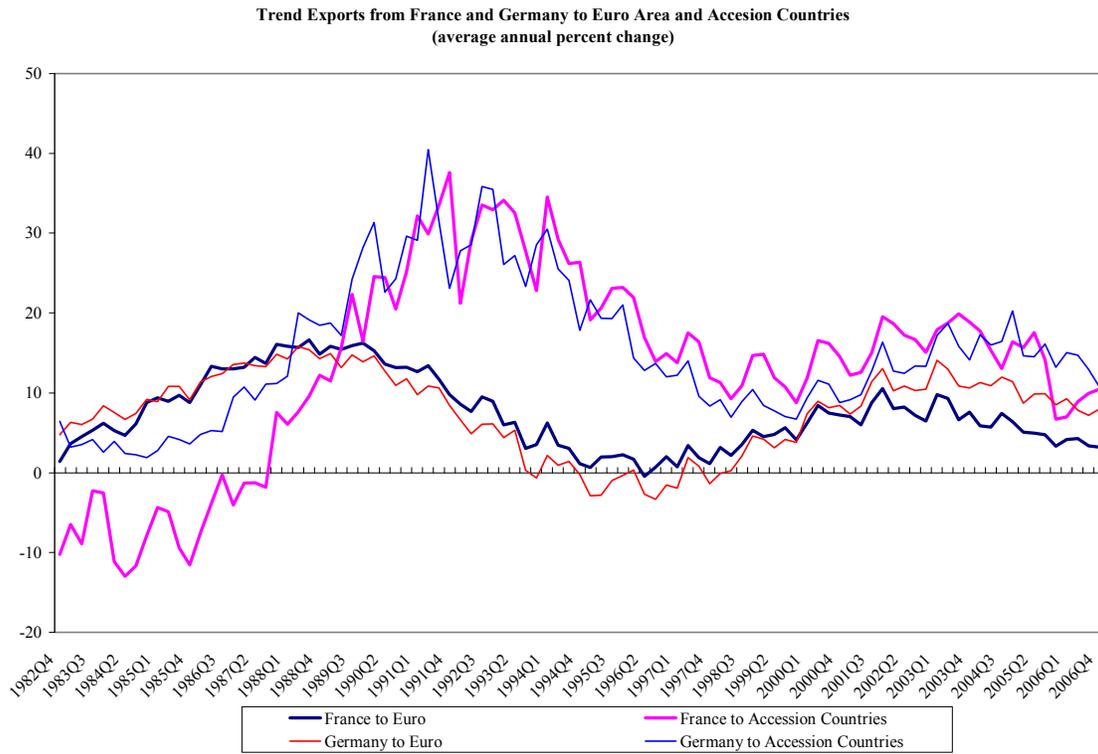


Figure 2. Trend Part (continued)

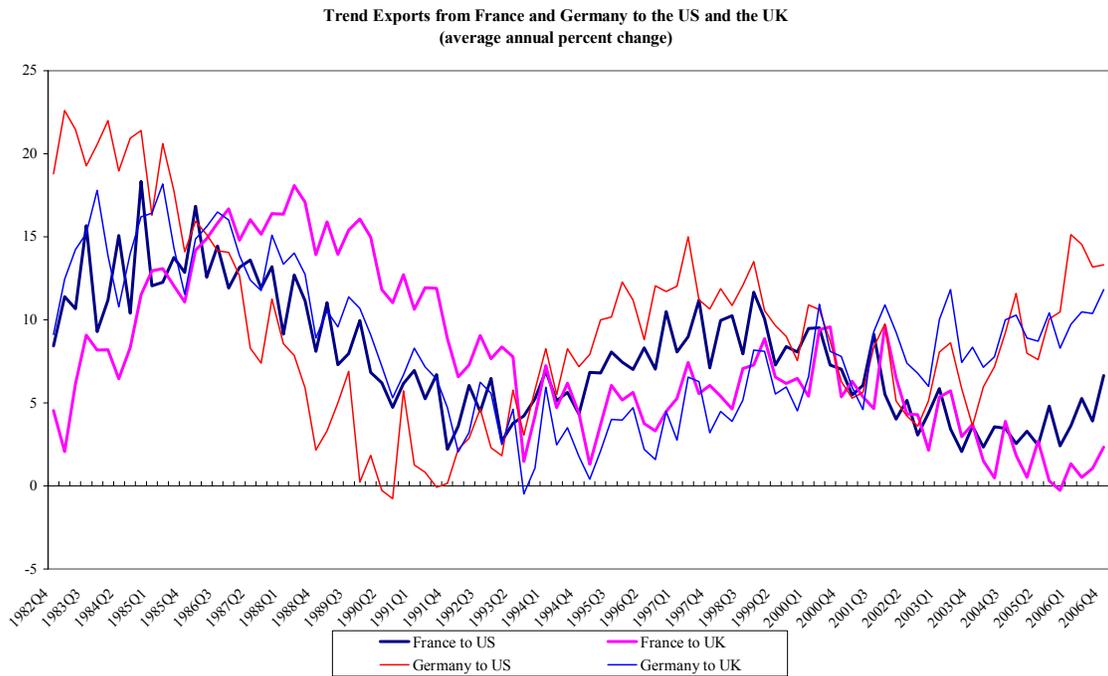
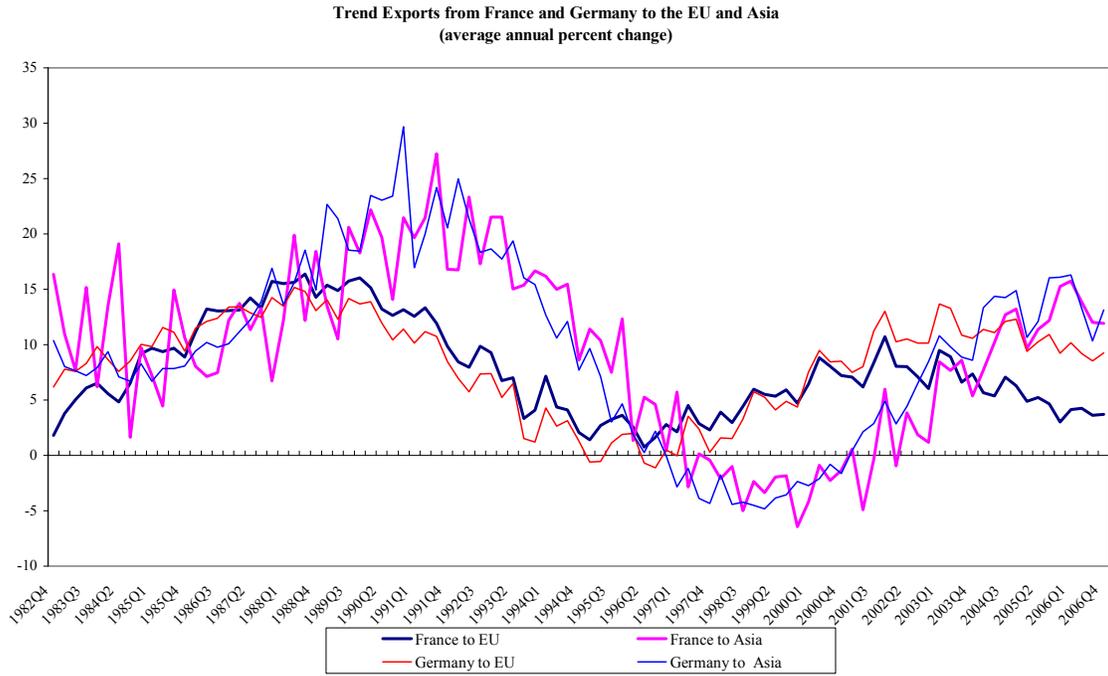


Figure 2. Trend Part (concluded)

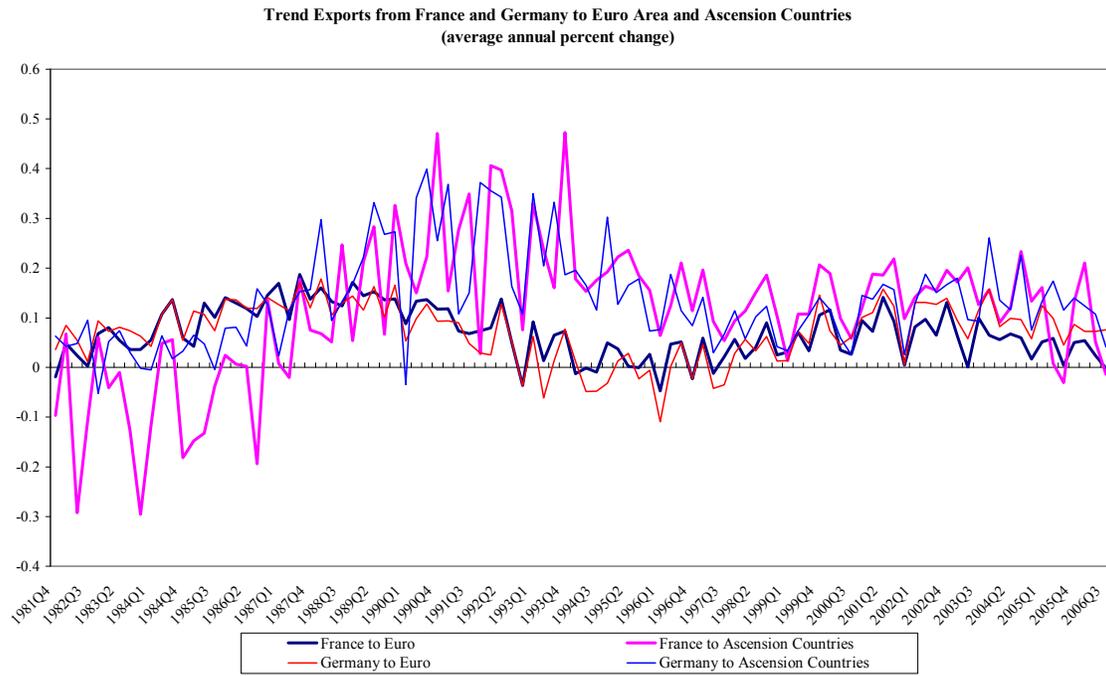


Table 1. Trend Exports per Destination 1/
(Average annual percent change)

		1980-2006	1980-1989	1990-1999	2000-2006
France	France to EU	1.7	2.3	1.3	1.2
	France to Asia	2.1	2.4	1.7	1.9
	France to Japan	1.9	3.5	1.0	1.5
	France to China	3.8	5.6	2.4	3.8
	France to Euro	1.6	2.3	1.2	1.2
	France to Accession Countries	2.6	0.0	4.9	2.6
	France to United States	1.9	2.8	1.9	1.1
	France to United Kingdom	1.8	2.7	1.6	0.6
	France to ROW	0.9	0.3	0.6	1.7
Germany	Germany to EU	1.9	2.5	0.9	2.2
	Germany to Asia	2.3	2.6	1.1	2.7
	Germany to Japan	2.2	3.9	0.3	1.5
	Germany to China	3.7	3.2	2.5	5.3
	Germany to Euro	1.8	2.5	0.6	2.1
	Germany to Accession Countries	3.2	2.1	4.4	3.0
	Germany to United States	2.3	2.8	1.9	2.2
	Germany to United Kingdom	2.0	3.0	1.2	1.8
	Germany to ROW	1.6	1.3	0.6	3.2

1/ Numbers in bold indicate a higher growth rate of French trend exports.

Table 2. Trend Exports per Product SITC 1/
(Average annual percent change)

		1980-2006	1980-1989	1990-1999	2000-2006
France	Total	1.5	2.1	1.0	1.4
	Food and live animal - SITC 0	0.9	1.3	0.7	0.5
	Beverages and tobacco - SITC 1	1.5	2.4	0.8	1.4
	Crude materials, inedible, except fuels - SITC 2	1.2	2.1	-0.3	2.3
	Mineral fuels, lubricants and related materials - SITC 3	1.5	-0.1	1.5	3.8
	Animal and vegetable oils, fats and waxes - SITC 4	1.2	0.8	0.6	2.3
	Chemicals and related products - SITC 5	2.1	2.7	1.4	2.2
	Manufactured goods - SITC 6	1.2	1.5	0.8	1.4
	Machinery and transport equipment - SITC 7	1.7	2.6	1.2	1.1
	Miscellaneous manufactured articles - SITC 8	1.7	2.5	1.0	1.7
	Commodities and transactions - SITC 9	-1.5	-2.8	-7.4	8.2
Germany	Total	1.9	2.3	1.0	2.5
	Food and live animal - SITC 0	1.5	1.8	0.7	2.1
	Beverages and tobacco - SITC 1	2.1	2.3	1.4	3.2
	Crude materials, inedible, except fuels - SITC 2	1.8	2.1	0.5	2.8
	Mineral fuels, lubricants and related materials - SITC 3	1.3	-1.3	0.6	4.7
	Animal and vegetable oils, fats and waxes - SITC 4	0.7	0.5	1.1	0.7
	Chemicals and related products - SITC 5	2.0	2.3	1.1	2.8
	Manufactured goods - SITC 6	1.6	2.0	0.6	2.4
	Machinery and transport equipment - SITC 7	2.0	2.5	1.1	2.4
	Miscellaneous manufactured articles - SITC 8	2.0	2.9	0.7	2.5
	Commodities and transactions - SITC 9	3.0	1.3	3.5	2.9

1/ Numbers in bold indicate a higher growth rate of French trend exports.

Table 3. Forecast Error Variance of the Common Components of French Variables Explained by the Supply and Demand Shocks to Unit Labor Costs in Manufacturing, 1980-2006 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals	
			Lower Bound	Upper Bound		Lower Bound	Upper Bound
1 GDP	0.81	0.75	0.16	0.90	0.12	0.04	0.71
2 Personal consumption expenditure	0.51	0.29	0.04	0.75	0.32	0.08	0.76
3 Private investment	0.86	0.38	0.03	0.88	0.44	0.06	0.89
4 Employment	0.70	0.74	0.20	0.89	0.08	0.03	0.58
5 Productivity	0.35	0.83	0.10	0.92	0.13	0.04	0.79
6 Unit labor cost of the manufacturing sector	0.74	0.07	0.02	0.62	0.93	0.36	0.98
7 Government savings	0.87	0.43	0.03	0.89	0.43	0.05	0.90
8 Consumer confidence	0.46	0.13	0.02	0.79	0.87	0.15	0.97
9 Industrial confidence	0.47	0.15	0.04	0.53	0.54	0.20	0.84
10 Consumer prices	0.90	0.05	0.00	0.60	0.83	0.30	0.94
11 Short-term interest rates	0.58	0.90	0.22	0.92	0.05	0.02	0.57
12 Long-term interest rates	0.59	0.41	0.06	0.80	0.07	0.01	0.47
13 M2 or M3	0.64	0.18	0.03	0.63	0.10	0.02	0.48
14 Stock prices	0.77	0.49	0.01	0.82	0.22	0.01	0.81
15 Real compensation of employees	0.62	0.77	0.24	0.89	0.07	0.03	0.54
16 SMIC	0.61	0.11	0.01	0.61	0.81	0.30	0.95
17 TFP	0.47	0.20	0.06	0.64	0.47	0.12	0.80
18 Exports total	0.81	0.92	0.15	0.92	0.04	0.01	0.60
19 Imports total	0.79	0.35	0.04	0.88	0.58	0.08	0.93
20 Terms of trade	0.10	0.48	0.01	0.77	0.06	0.02	0.65
21 Real effective exchange	0.79	0.61	0.01	0.91	0.31	0.01	0.83
22 Current account balance	0.42	0.33	0.04	0.83	0.60	0.08	0.92
23 FDI out	0.72	0.56	0.02	0.88	0.30	0.02	0.88
24 FDI in	0.52	0.55	0.02	0.87	0.24	0.02	0.85
25 Exports to Euro	0.83	0.26	0.01	0.72	0.57	0.06	0.89
26 Exports to EU	0.84	0.28	0.01	0.72	0.58	0.07	0.90
27 Exports to EU accession ctrys	0.69	0.11	0.00	0.68	0.68	0.20	0.91
28 Exports to United States	0.44	0.44	0.01	0.74	0.17	0.00	0.74
29 Exports to United Kingdom	0.74	0.38	0.01	0.81	0.57	0.07	0.93
30 Exports to Japan	0.77	0.45	0.03	0.74	0.33	0.04	0.76
31 Exports to China,P.R.: Mainland	0.16	0.43	0.02	0.81	0.44	0.04	0.86
32 Exports to Asia	0.56	0.35	0.03	0.76	0.51	0.09	0.87
33 Exports to ROW	0.64	0.37	0.02	0.81	0.60	0.12	0.95
34 EXP SITC Total	0.90	0.64	0.01	0.69	0.09	0.09	0.88
35 EXP SITC 0: Food and live animal	0.64	0.77	0.01	0.85	0.02	0.02	0.85
36 EXP SITC 1: Beverages and tobacco	0.87	0.67	0.01	0.80	0.02	0.02	0.87
37 EXP SITC 2: Crude materials, inefible, except fuels	0.91	0.71	0.03	0.67	0.11	0.14	0.85
38 EXP SITC 3: Mineral fuels, lubricants and related materials	0.59	0.15	0.02	0.87	0.81	0.07	0.95
39 EXP SITC 4: Animal and vegetable oils, fats and waxes	0.63	0.28	0.04	0.42	0.04	0.01	0.33
40 EXP SITC 5: Chemicals and related products, n.e.s	0.92	0.75	0.02	0.75	0.05	0.05	0.83
41 EXP SITC 6: Manufactured goods	0.92	0.71	0.02	0.71	0.09	0.12	0.88
42 EXP SITC 7: Machinery and transport equipment	0.87	0.51	0.01	0.62	0.12	0.11	0.85
43 EXP SITC 8: Miscellaneous manufactured articles	0.87	0.64	0.01	0.75	0.05	0.05	0.87
44 EXP SITC 9: Commodities and transactions n.e.c	0.24	0.42	0.03	0.90	0.37	0.01	0.65

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

Table 4. Forecast Error Variance of the Common Components of German Variables Explained by the Supply and Demand Shocks to Unit Labor Costs in Manufacturing, 1980-2006 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals	
			Lower Bound	Upper Bound		Lower Bound	Upper Bound
1 GDP	0.70	0.13	0.01	0.83	0.82	0.11	0.86
2 Personal consumption expenditure	0.34	0.02	0.00	0.51	0.84	0.20	0.85
3 Private investment	0.93	0.05	0.02	0.58	0.86	0.28	0.90
4 Employment	0.77	0.05	0.01	0.69	0.79	0.11	0.83
5 Productivity	0.36	0.30	0.03	0.89	0.45	0.01	0.62
6 Unit labor cost of the manufacturing sector	0.73	0.34	0.00	0.62	0.66	0.35	0.96
7 Government savings	0.70	0.01	0.01	0.62	0.88	0.20	0.88
8 Consumer confidence	0.32	0.02	0.01	0.51	0.89	0.36	0.93
9 Industrial confidence	0.54	0.25	0.04	0.48	0.62	0.30	0.87
10 Consumer prices	0.92	0.69	0.02	0.86	0.03	0.01	0.77
11 Short-term interest rates	0.76	0.07	0.02	0.77	0.88	0.15	0.89
12 Long-term interest rates	0.54	0.38	0.04	0.76	0.43	0.02	0.64
13 M2 or M3	0.47	0.30	0.01	0.79	0.51	0.05	0.62
14 Stock prices	0.69	0.01	0.01	0.55	0.87	0.22	0.86
15 Real compensation of employees	0.54	0.61	0.03	0.89	0.31	0.04	0.50
16 Exports total	0.69	0.15	0.01	0.79	0.81	0.14	0.87
17 Imports total	0.84	0.04	0.01	0.60	0.89	0.28	0.91
18 Terms of trade	0.42	0.70	0.06	0.91	0.05	0.02	0.75
19 Real effective exchange	0.74	0.21	0.03	0.88	0.61	0.02	0.81
20 Current account balance	0.17	0.05	0.01	0.62	0.01	0.02	0.38
21 FDI out	0.52	0.32	0.01	0.60	0.40	0.11	0.85
22 FDI in	0.15	0.01	0.01	0.60	0.86	0.20	0.88
23 Exports to Euro	0.89	0.52	0.06	0.87	0.10	0.01	0.60
24 Exports to EU	0.90	0.52	0.07	0.87	0.12	0.01	0.56
25 Exports to EU accession ctrys	0.64	0.57	0.02	0.85	0.04	0.00	0.62
26 Exports to United States	0.49	0.84	0.06	0.91	0.02	0.01	0.51
27 Exports to United Kingdom	0.87	0.44	0.04	0.87	0.28	0.02	0.42
28 Exports to Japan	0.81	0.63	0.04	0.92	0.19	0.03	0.48
29 Exports to China,P.R.: Mainland	0.69	0.22	0.01	0.64	0.47	0.07	0.72
30 Exports to Asia	0.76	0.56	0.03	0.90	0.29	0.03	0.44
31 Exports to ROW	0.92	0.48	0.05	0.86	0.13	0.01	0.54
32 EXP SITC Total	0.92	0.37	0.05	0.82	0.44	0.01	0.46
33 EXP SITC 0: Food and live animal	0.92	0.38	0.03	0.81	0.36	0.00	0.42
34 EXP SITC 1: Beverages and tobacco	0.58	0.37	0.01	0.79	0.21	0.00	0.32
35 EXP SITC 2: Crude materials, inefible, except fuels	0.81	0.36	0.06	0.87	0.57	0.03	0.66
36 EXP SITC 3: Mineral fuels, lubricants and related materials	0.64	0.08	0.02	0.55	0.86	0.41	0.92
37 EXP SITC 4: Animal and vegetable oils, fats and waxes	0.41	0.28	0.01	0.66	0.21	0.04	0.44
38 EXP SITC 5: Chemicals and related products, n.e.s	0.89	0.47	0.07	0.86	0.41	0.01	0.46
39 EXP SITC 6: Manufactured goods	0.91	0.40	0.06	0.84	0.45	0.01	0.50
40 EXP SITC 7: Machinery and transport equipment	0.89	0.37	0.03	0.81	0.39	0.00	0.41
41 EXP SITC 8: Miscellaneous manufactured articles	0.92	0.36	0.03	0.81	0.36	0.00	0.41
42 EXP SITC 9: Commodities and transactions n.e.c	0.08	0.09	0.01	0.68	0.68	0.03	0.74

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

Table 5. Forecast Error Variance of the Common Components of French Variables Explained by the Supply and Demand Shocks to Terms of Trade, 1980-2006 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals	
			Lower Bound	Upper Bound		Lower Bound	Upper Bound
1 GDP	0.81	0.46	0.08	0.83	0.08	0.05	0.79
2 Personal consumption expenditure	0.51	0.61	0.12	0.83	0.24	0.04	0.68
3 Private investment	0.86	0.33	0.02	0.82	0.43	0.05	0.87
4 Employment	0.70	0.39	0.08	0.81	0.05	0.06	0.75
5 Productivity	0.35	0.37	0.02	0.80	0.14	0.07	0.87
6 Unit labor cost of the manufacturing sector	0.74	0.07	0.02	0.74	0.22	0.00	0.53
7 Government savings	0.87	0.29	0.01	0.81	0.46	0.06	0.88
8 Consumer confidence	0.46	0.18	0.02	0.80	0.25	0.01	0.64
9 Industrial confidence	0.47	0.38	0.11	0.81	0.04	0.00	0.38
10 Consumer prices	0.90	0.01	0.00	0.60	0.26	0.00	0.58
11 Short-term interest rates	0.58	0.19	0.02	0.72	0.03	0.05	0.79
12 Long-term interest rates	0.59	0.25	0.02	0.76	0.12	0.02	0.47
13 M2 or M3	0.64	0.26	0.02	0.66	0.16	0.03	0.62
14 Stock prices	0.77	0.02	0.00	0.55	0.63	0.24	0.90
15 Real compensation of employees	0.62	0.25	0.03	0.70	0.05	0.09	0.80
16 SMIC	0.61	0.02	0.01	0.61	0.20	0.00	0.48
17 TFP	0.47	0.68	0.26	0.89	0.09	0.02	0.44
18 Exports total	0.81	0.14	0.01	0.73	0.03	0.02	0.71
19 Imports total	0.79	0.37	0.03	0.84	0.32	0.03	0.78
20 Terms of trade	0.10	0.13	0.03	0.50	0.82	0.47	0.96
21 Real effective exchange	0.79	0.00	0.00	0.42	0.10	0.00	0.46
22 Current account balance	0.42	0.47	0.08	0.85	0.17	0.02	0.63
23 FDI out	0.72	0.11	0.00	0.65	0.54	0.16	0.89
24 FDI in	0.52	0.08	0.00	0.64	0.63	0.22	0.91
25 Exports to Euro	0.83	0.05	0.01	0.69	0.16	0.00	0.33
26 Exports to EU	0.84	0.04	0.01	0.69	0.16	0.00	0.33
27 Exports to EU accession ctrys	0.69	0.00	0.00	0.54	0.24	0.00	0.54
28 Exports to United States	0.44	0.01	0.00	0.46	0.52	0.23	0.86
29 Exports to United Kingdom	0.74	0.04	0.01	0.70	0.12	0.00	0.37
30 Exports to Japan	0.77	0.18	0.03	0.68	0.04	0.02	0.60
31 Exports to China,P.R.: Mainland	0.16	0.08	0.02	0.68	0.08	0.01	0.47
32 Exports to Asia	0.56	0.13	0.03	0.76	0.09	0.00	0.43
33 Exports to ROW	0.64	0.05	0.02	0.69	0.11	0.00	0.35
34 EXP SITC Total	0.90	0.39	0.01	0.69	0.03	0.01	0.32
35 EXP SITC 0: Food and live animal	0.64	0.25	0.01	0.53	0.10	0.01	0.51
36 EXP SITC 1: Beverages and tobacco	0.87	0.23	0.00	0.54	0.02	0.00	0.29
37 EXP SITC 2: Crude materials, inefible, except fuels	0.91	0.57	0.05	0.77	0.07	0.01	0.54
38 EXP SITC 3: Mineral fuels, lubricants and related materials	0.59	0.37	0.03	0.82	0.37	0.01	0.67
39 EXP SITC 4: Animal and vegetable oils, fats and waxes	0.63	0.56	0.08	0.68	0.36	0.21	0.86
40 EXP SITC 5: Chemicals and related products, n.e.s	0.92	0.41	0.02	0.65	0.09	0.01	0.52
41 EXP SITC 6: Manufactured goods	0.92	0.42	0.02	0.69	0.03	0.01	0.38
42 EXP SITC 7: Machinery and transport equipment	0.87	0.41	0.01	0.73	0.04	0.01	0.30
43 EXP SITC 8: Miscellaneous manufactured articles	0.87	0.30	0.00	0.61	0.02	0.00	0.28
44 EXP SITC 9: Commodities and transactions n.e.c	0.24	0.03	0.01	0.70	0.58	0.03	0.78

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

Table 6. Forecast Error Variance of the Common Components of German Variables Explained by the Supply and Demand Shocks Terms of Trade, 1980-2006 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals	
			Lower Bound	Upper Bound		Lower Bound	Upper Bound
1 GDP	0.70	0.46	0.08	0.92	0.26	0.01	0.43
2 Personal consumption expenditure	0.34	0.03	0.01	0.80	0.55	0.01	0.63
3 Private investment	0.93	0.09	0.04	0.88	0.73	0.02	0.73
4 Employment	0.77	0.27	0.06	0.88	0.53	0.01	0.63
5 Productivity	0.36	0.30	0.01	0.79	0.36	0.05	0.82
6 Unit labor cost of the manufacturing sector	0.73	0.06	0.03	0.74	0.76	0.07	0.81
7 Government savings	0.70	0.09	0.02	0.86	0.55	0.01	0.60
8 Consumer confidence	0.32	0.02	0.01	0.85	0.57	0.01	0.62
9 Industrial confidence	0.54	0.23	0.05	0.69	0.21	0.01	0.52
10 Consumer prices	0.92	0.04	0.00	0.30	0.93	0.64	0.98
11 Short-term interest rates	0.76	0.32	0.07	0.91	0.44	0.01	0.53
12 Long-term interest rates	0.54	0.16	0.07	0.78	0.14	0.02	0.61
13 M2 or M3	0.47	0.54	0.08	0.82	0.13	0.01	0.36
14 Stock prices	0.69	0.07	0.02	0.84	0.58	0.01	0.63
15 Real compensation of employees	0.54	0.70	0.07	0.84	0.12	0.04	0.71
16 Exports total	0.69	0.54	0.12	0.91	0.33	0.01	0.48
17 Imports total	0.84	0.11	0.05	0.89	0.71	0.02	0.69
18 Terms of trade	0.42	0.11	0.01	0.43	0.88	0.56	0.99
19 Real effective exchange	0.74	0.39	0.04	0.86	0.09	0.03	0.64
20 Current account balance	0.17	0.15	0.01	0.43	0.53	0.06	0.70
21 FDI out	0.52	0.02	0.01	0.65	0.88	0.22	0.91
22 FDI in	0.15	0.07	0.01	0.88	0.45	0.00	0.51
23 Exports to Euro	0.89	0.10	0.01	0.40	0.86	0.53	0.97
24 Exports to EU	0.90	0.12	0.01	0.44	0.84	0.47	0.96
25 Exports to EU accession ctrys	0.64	0.03	0.00	0.31	0.93	0.62	0.96
26 Exports to United States	0.49	0.11	0.01	0.52	0.67	0.27	0.92
27 Exports to United Kingdom	0.87	0.33	0.02	0.67	0.42	0.15	0.88
28 Exports to Japan	0.81	0.42	0.02	0.69	0.44	0.20	0.88
29 Exports to China,P.R.: Mainland	0.69	0.26	0.09	0.85	0.01	0.01	0.42
30 Exports to Asia	0.76	0.54	0.04	0.80	0.27	0.09	0.82
31 Exports to ROW	0.92	0.12	0.01	0.42	0.81	0.46	0.95
32 EXP SITC Total	0.92	0.05	0.01	0.51	0.89	0.36	0.96
33 EXP SITC 0: Food and live animal	0.92	0.03	0.00	0.48	0.89	0.38	0.96
34 EXP SITC 1: Beverages and tobacco	0.58	0.02	0.00	0.46	0.79	0.24	0.93
35 EXP SITC 2: Crude materials, inefible, except fuels	0.81	0.05	0.02	0.65	0.89	0.23	0.94
36 EXP SITC 3: Mineral fuels, lubricants and related materials	0.64	0.25	0.05	0.80	0.69	0.05	0.78
37 EXP SITC 4: Animal and vegetable oils, fats and waxes	0.41	0.20	0.04	0.77	0.08	0.00	0.31
38 EXP SITC 5: Chemicals and related products, n.e.s	0.89	0.04	0.01	0.56	0.89	0.26	0.96
39 EXP SITC 6: Manufactured goods	0.91	0.05	0.01	0.55	0.88	0.31	0.96
40 EXP SITC 7: Machinery and transport equipment	0.89	0.05	0.01	0.49	0.87	0.39	0.96
41 EXP SITC 8: Miscellaneous manufactured articles	0.92	0.04	0.00	0.47	0.89	0.38	0.96
42 EXP SITC 9: Commodities and transactions n.e.c	0.08	0.19	0.01	0.62	0.79	0.33	0.95

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

Table 7. Forecast Error Variance of the Common Components of France Variables Explained by the Supply and Demand Shock to ULCM, 1993-2006 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals	
			Lower Bound	Upper Bound		Lower Bound	Upper Bound
1 GDP	0.88	0.32	0.01	0.92	0.59	0.03	0.95
2 Personal consumption expenditure	0.59	0.28	0.01	0.92	0.64	0.04	0.96
3 Private investment	0.89	0.26	0.01	0.94	0.66	0.02	0.97
4 Employment	0.84	0.27	0.03	0.87	0.62	0.03	0.90
5 Productivity	0.72	0.78	0.01	0.74	0.10	0.04	0.89
6 Unit labor cost of the manufacturing sector	0.73	0.13	0.00	0.95	0.79	0.02	0.98
7 Government savings	0.89	0.31	0.01	0.93	0.59	0.02	0.96
8 Consumer confidence	0.71	0.59	0.01	0.80	0.28	0.06	0.93
9 Industrial confidence	0.60	0.29	0.01	0.67	0.43	0.08	0.89
10 Consumer prices	0.86	0.19	0.01	0.93	0.68	0.02	0.97
11 Short-term interest rates	0.67	0.31	0.04	0.86	0.49	0.04	0.86
12 Long-term interest rates	0.71	0.38	0.02	0.63	0.45	0.01	0.63
13 M2 or M3	0.39	0.49	0.02	0.72	0.29	0.02	0.63
14 Stock prices	0.94	0.61	0.01	0.82	0.21	0.02	0.86
15 Real compensation of employees	0.79	0.32	0.05	0.86	0.47	0.04	0.84
16 SMIC	0.71	0.08	0.00	0.95	0.81	0.02	0.98
17 TFP	0.86	0.12	0.01	0.95	0.83	0.03	0.97
18 Exports total	0.70	0.30	0.03	0.88	0.58	0.03	0.91
19 Imports total	0.90	0.23	0.01	0.94	0.71	0.04	0.97
20 Terms of trade	0.10	0.23	0.01	0.83	0.42	0.04	0.82
21 Real effective exchange	0.80	0.37	0.02	0.65	0.01	0.05	0.70
22 Current account balance	0.86	0.28	0.03	0.76	0.57	0.04	0.84
23 FDI out	0.91	0.61	0.01	0.79	0.23	0.03	0.89
24 FDI in	0.67	0.33	0.03	0.87	0.48	0.04	0.87
25 Exports to Euro	0.86	0.10	0.01	0.68	0.42	0.08	0.87
26 Exports to EU	0.88	0.10	0.01	0.68	0.41	0.08	0.87
27 Exports to EU accession ctrys	0.78	0.02	0.00	0.88	0.71	0.04	0.94
28 Exports to United States	0.86	0.77	0.02	0.64	0.06	0.05	0.82
29 Exports to United Kingdom	0.87	0.21	0.01	0.69	0.20	0.08	0.86
30 Exports to Japan	0.86	0.29	0.01	0.56	0.28	0.03	0.69
31 Exports to China,P.R.: Mainland	0.57	0.29	0.01	0.68	0.08	0.06	0.82
32 Exports to Asia	0.70	0.23	0.01	0.62	0.48	0.03	0.79
33 Exports to ROW	0.70	0.27	0.01	0.72	0.16	0.08	0.87
34 EXP SITC Total	0.93	0.04	0.01	0.68	0.93	0.08	0.89
35 EXP SITC 0: Food and live animal	0.67	0.32	0.01	0.72	0.51	0.07	0.79
36 EXP SITC 1: Beverages and tobacco	0.91	0.08	0.01	0.71	0.86	0.09	0.87
37 EXP SITC 2: Crude materials, inefible, except fuels	0.93	0.07	0.01	0.66	0.90	0.05	0.87
38 EXP SITC 3: Mineral fuels, lubricants and related materials	0.74	0.05	0.01	0.86	0.93	0.09	0.95
39 EXP SITC 4: Animal and vegetable oils, fats and waxes	0.79	0.52	0.01	0.72	0.38	0.04	0.72
40 EXP SITC 5: Chemicals and related products, n.e.s	0.94	0.15	0.00	0.70	0.82	0.06	0.83
41 EXP SITC 6: Manufactured goods	0.94	0.07	0.01	0.68	0.90	0.07	0.88
42 EXP SITC 7: Machinery and transport equipment	0.90	0.02	0.00	0.70	0.97	0.07	0.93
43 EXP SITC 8: Miscellaneous manufactured articles	0.91	0.06	0.01	0.68	0.91	0.10	0.88
44 EXP SITC 9: Commodities and transactions n.e.c	0.57	0.52	0.01	0.74	0.40	0.04	0.74

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

Table 8. Forecast Error Variance of the Common Components of Germany Variables Explained by the Supply and Demand Shock to ULCM, 1993-2006 1/

	Variance Shares of the Common Components	Supply Shocks	Confidence Intervals		Demand Shock	Confidence Intervals	
			Lower Bound	Upper Bound		Lower Bound	Upper Bound
1 GDP	0.90	0.14	0.02	0.59	0.43	0.29	0.91
2 Personal consumption expenditure	0.77	0.25	0.01	0.56	0.30	0.12	0.81
3 Private investment	0.95	0.05	0.01	0.45	0.79	0.49	0.96
4 Employment	0.90	0.06	0.02	0.55	0.59	0.36	0.93
5 Productivity	0.34	0.33	0.02	0.80	0.38	0.01	0.45
6 Unit labor cost of the manufacturing sector	0.81	0.05	0.00	0.35	0.93	0.58	0.99
7 Government savings	0.88	0.01	0.01	0.51	0.67	0.27	0.91
8 Consumer confidence	0.59	0.04	0.00	0.33	0.87	0.50	0.94
9 Industrial confidence	0.65	0.11	0.01	0.49	0.73	0.21	0.92
10 Consumer prices	0.94	0.09	0.00	0.42	0.85	0.46	0.97
11 Short-term interest rates	0.91	0.03	0.02	0.62	0.52	0.26	0.92
12 Long-term interest rates	0.69	0.85	0.01	0.75	0.03	0.01	0.57
13 M2 or M3	0.72	0.26	0.01	0.63	0.28	0.06	0.67
14 Stock prices	0.86	0.01	0.01	0.48	0.78	0.37	0.94
15 Real compensation of employees	0.51	0.07	0.02	0.73	0.33	0.07	0.61
16 Exports total	0.80	0.17	0.01	0.52	0.58	0.38	0.94
17 Imports total	0.92	0.06	0.01	0.42	0.82	0.53	0.97
18 Terms of trade	0.39	0.29	0.00	0.54	0.69	0.30	0.94
19 Real effective exchange	0.64	0.01	0.02	0.71	0.26	0.10	0.79
20 Current account balance	0.60	0.05	0.01	0.57	0.42	0.07	0.81
21 FDI out	0.61	0.01	0.00	0.41	0.93	0.42	0.95
22 FDI in	0.20	0.03	0.01	0.51	0.69	0.18	0.88
23 Exports to Euro	0.91	0.12	0.01	0.61	0.64	0.20	0.90
24 Exports to EU	0.92	0.12	0.01	0.63	0.60	0.18	0.88
25 Exports to EU accession ctrys	0.76	0.12	0.00	0.56	0.72	0.28	0.92
26 Exports to United States	0.74	0.01	0.03	0.76	0.24	0.08	0.52
27 Exports to United Kingdom	0.91	0.09	0.02	0.72	0.34	0.09	0.68
28 Exports to Japan	0.89	0.19	0.02	0.72	0.24	0.07	0.59
29 Exports to China,P.R.: Mainland	0.67	0.06	0.01	0.47	0.76	0.39	0.96
30 Exports to Asia	0.95	0.32	0.02	0.70	0.05	0.07	0.50
31 Exports to ROW	0.94	0.16	0.00	0.63	0.59	0.19	0.88
32 EXP SITC Total	0.95	0.10	0.01	0.67	0.45	0.13	0.87
33 EXP SITC 0: Food and live animal	0.95	0.05	0.01	0.70	0.49	0.13	0.87
34 EXP SITC 1: Beverages and tobacco	0.67	0.26	0.02	0.78	0.25	0.07	0.62
35 EXP SITC 2: Crude materials, inefible, except fuels	0.85	0.11	0.01	0.64	0.49	0.16	0.89
36 EXP SITC 3: Mineral fuels, lubricants and related materials	0.59	0.01	0.00	0.38	0.83	0.48	0.97
37 EXP SITC 4: Animal and vegetable oils, fats and waxes	0.67	0.13	0.05	0.79	0.18	0.04	0.49
38 EXP SITC 5: Chemicals and related products, n.e.s	0.94	0.14	0.01	0.70	0.41	0.12	0.83
39 EXP SITC 6: Manufactured goods	0.92	0.10	0.01	0.68	0.45	0.13	0.86
40 EXP SITC 7: Machinery and transport equipment	0.92	0.09	0.01	0.69	0.46	0.14	0.86
41 EXP SITC 8: Miscellaneous manufactured articles	0.94	0.07	0.01	0.71	0.47	0.13	0.86
42 EXP SITC 9: Commodities and transactions n.e.c	0.61	0.43	0.01	0.72	0.07	0.01	0.41

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

Appendix I. The Corbae-Ouliaris Ideal Band-Pass Filter

Let us assume that X_t is an I(1) process with $\Delta X_t = v_t$ such that v_t has a Wold representation. The spectral density of v_t is $f_{vv}(\lambda) > 0$, for all λ . The discrete Fourier transform of X_t for $\lambda_t \neq 0$:

$$w_X(\lambda_s) = \frac{1}{1 - e^{i\lambda_s}} w_v(\lambda_s) - \frac{e^{i\lambda_s}}{1 - e^{i\lambda_s}} \frac{(X_n - X_0)}{n^{1/2}},$$

where $\lambda_s = \frac{2\pi s}{n}$, $s = 0, 1, \dots, n-1$, are the fundamental frequencies. The second term makes it clear that the Fourier transform is not asymptotically independent across fundamental frequencies because the second term is a deterministic trend in the frequency domain with a random coefficient $\frac{(X_n - X_0)}{n^{1/2}}$. Unless that term is removed, it will produce leakages into all frequencies $\lambda_t \neq 0$, even in the limit as $n \rightarrow \infty$. Sacrificing a single observation, instead of estimating the random coefficient a la Hannan (1970), Corbae and Ouliaris (2006) show that by imposing that $(X_n - X_1) = (X_n - X_0)$ will produce an estimate that will have no finite sampling error, has superior endpoint properties, and has much lower mean-squared error than popular time-domain filters such as HP or B-K. In addition, in contrast to B-K, it is consistent. This is the ideal band-pass filter used in the paper.

Appendix II. The Approximate Dynamic Factor Model

This study uses a large dimensional approximate dynamic factor model in the tradition of Stock and Watson (1998 and 2002). In contrast to the models of Sargent and Sims (1977) and Geweke (1977), it admits the possibility of serial correlation and weakly 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 (2006 and 2007).

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 few common shocks, which are the same for all variables. Nevertheless, the effects of common shocks differ from one variable to another due to different factor loadings. The idiosyncratic component is driven by idiosyncratic shocks, 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.

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

$$\Xi_t = Y_t - X_t. \tag{4}$$

From all the more or less formal criteria to determine the number of static factors r , Bai and Ng (2002) information criteria was followed. As in Forni and others (2005), F_t was approximated by an autoregressive representation of order 1¹¹:

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

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).

Once a decision is taken on the process followed by the common components, structural shocks have to be identified by focusing on the reduced form VAR residuals of (5). Following Eickmeier (2007), the identification scheme has three steps. First, maximize the variance of the forecast error of the chosen variable and calculate impulse-response functions. The interest here is unit labor costs in manufacturing (ULCM) and terms of trade. So, using ULCM as an example, a few major shocks driving unit them are identified.¹² This implies maximizing the explanation of the chosen variance of the k -step ahead forecast error of ULCM with a reduced number of shocks.¹³ To this end, k -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,

$$\text{cov}(u_t) = AE(v_t v_t')A' = AA'. \quad (6)$$

The impulse-response function of y_{it} to the identified shock in period k is obtained as follows:

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

¹¹ VAR(1) provides a dynamic representation which is parsimonious and quite general (for more details, see Gianonne, 2005). The residuals u_t were white noise and thus an autoregressive process of order 1 was chosen.

¹² Uhlig (2003) shows that two shocks are sufficient to explain 90 percent of the variance at all horizons of real U.S. GNP.

¹³ 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 which explanation 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 $\{30,120\}$ or $\{60,150\}$ would be equally acceptable. The grid of the angle of rotation can be different, of course. This paper uses a grid of 30 degrees.

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, the identified shocks are assumed to be linearly correlated to a vector of fundamentals. The fundamental forces $\omega_t = (\omega_{1t}, \omega_{2t}, \dots, \omega_{rt})'$ behind France's ULCM are correlated to the identified shocks through the $r \times r$ matrix Q . Thus,

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

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 France's ULCM *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, the French ULCM, 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_1 is the first eigenvector of S_{ik} with eigenvalue λ and, therefore, the shock associated with q_1 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 (2007), 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.

Finally, orthogonal shocks are 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 and Zha (1999), and as in Peersman (2005), Canova and de Nicoló (2003), Eickmeier (2007), Kabundi and Nadal De Simone (2007) 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_t are associated to the two structural shocks w_t through the matrix P , and the impulse-response functions of the two structural shocks on all the fundamental forces can be estimated.

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.¹⁴ 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.

Identification Inequalities		
	Increase in ULCM	
	Supply shock	Demand shock
ULCM	≥ 0	≥ 0
Output	≤ 0	≥ 0
Real wages	≤ 0	≥ 0
Increase in Terms of Trade		
	Supply shock	Demand shock
Terms of trade	≥ 0	≥ 0
Consumption	≥ 0	≤ 0
Current account	≤ 0	≥ 0

¹⁴ See Peersman (2005) for more technical details.

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
1	World	Commodity Industrial Inputs Price Index, 1995 = 100, includes Agricultural Raw Materials and Metals Price Indices
2	World	Crude Oil (petroleum), simple average of three spot prices; Dated Brent, West Texas Intermediate, and the Dubai Fateh, US\$ per barrel
3	World	Exchange rate, U.S. dollars per national currency, period average
4	World	Fed Funds
5	World	S&P 500
6	World	World demand
7	World	World reserves
8	France	PPI
9	France	Real Effective exchange rate, 2000 = 100, ULC-based
10	France	Gross domestic product deflator
11	France	CPI
12	France	Import Unit Values / Import Prices
13	France	Export Unit Values / Export Prices
14	France	Private final consumption expenditure, volume
15	France	Dependent employment
16	France	Dependent employment of the business sector
17	France	Government employment
18	France	Self-employed
19	France	Total employment
20	France	Employment of the business sector
21	France	Exchange rate, index of US\$ per local currency
22	France	Gross domestic product, constant prices
23	France	Private non-residential fixed capital formation, volume
24	France	Fixed investment in non-residential construction, volume
25	France	Fixed investment in construction, volume
26	France	Government fixed capital formation, volume
27	France	Private residential fixed capital formation, volume
28	France	Fixed investment in machinery & equipment, volume
29	France	Industrial production
30	France	Private total fixed capital formation, volume
31	France	Gross total fixed capital formation, volume
32	France	Labor force
33	France	Imports of goods and services, volume, national accounts basis
34	France	Labor productivity of the total economy
35	France	Household saving, value
36	France	Current transfers received by households, value
37	France	Unit labor cost of the total economy
38	France	Unit labor cost of the manufacturing sector
39	France	Unemployment
40	France	Wages, value
41	France	Wages of the government sector, value
42	France	Wage rate of the business sector
43	France	Compensation rate of government employees
44	France	Wage rate of the manufacturing sector, hourly earnings
45	France	Compensation rate of the business sector
46	France	Compensation of employees, value

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
47	France	Exports of goods and services, volume, national accounts basis
48	France	Household disposable income, real
49	France	Property income received by households, value
50	France	Government current disbursements, value
51	France	Current disbursements of households, value
52	France	Government current receipts, value
53	France	Current receipts of households, value
54	France	Self-employment income received by households, value
55	France	Money supply, broad definition M2 or M3
56	France	Credit to private sector
57	France	HPI
58	France	SPI
59	France	TFP growth
60	France	Direct investment abroad
61	France	Dir. invest. in rep. econ., n.i.e.
62	France	Portfolio investment assets
63	France	Portfolio investment liab., n.i.e
64	France	Other investment assets
65	France	Other investment liab., n.i.e
66	France	Financial account, n.i.e.
67	France	Capacity utilization
68	France	Balance of income, value, balance of payments basis
69	France	Current account, value
70	France	Current account, value in US\$
71	France	Government consumption of fixed capital, value
72	France	Long-term interest rate on government bonds
73	France	Short-term interest rate \ PERCENT
74	France	Increase in stocks, volume
75	France	Labor force participation rate
76	France	Government saving(net), value
77	France	Household saving ratio
78	France	Unemployment rate
79	France	Industrial confidence
80	France	Consumer confidence
81	France	Smic
82	France	Terms of trade
83	France	Real compensation of employees
84	Germany	PPI
85	Germany	Real Effective exchange rate, 2000 = 100, ULC-based
86	Germany	Gross domestic product, deflator, market prices
87	Germany	Q2-2007
88	Germany	Import Unit Values / Import Prices
89	Germany	Export Unit Values / Export Prices
90	Germany	Government consumption of fixed capital, value
91	Germany	Private final consumption expenditure, volume
92	Germany	Dependent employment
93	Germany	Self-employed
94	Germany	Total employment

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
95	Germany	Exchange rate, index of US\$ per local currency
96	Germany	Gross domestic product, volume, market prices
97	Germany	Private non-residential fixed capital formation, volume
98	Germany	Fixed investment in non-residential construction, volume
99	Germany	Fixed investment in construction, volume
100	Germany	Government fixed capital formation, volume
101	Germany	Private residential fixed capital formation, volume
102	Germany	Fixed investment in machinery & equipment, volume
103	Germany	Industrial production
104	Germany	Private total fixed capital formation, volume
105	Germany	Gross total fixed capital formation, volume
106	Germany	Labor force
107	Germany	Imports of goods and services, volume, national accounts basis
108	Germany	Labor productivity of the total economy
109	Germany	Household saving, value
110	Germany	Current transfers received by households, value
111	Germany	Unit labor cost of the total economy
112	Germany	Unit labor cost of the manufacturing sector
113	Germany	Unemployment
114	Germany	Wages, value
115	Germany	Wages of the government sector, value
116	Germany	Compensation of employees, value
117	Germany	Exports of goods and services, volume, national accounts basis
118	Germany	Factor income from abroad, volume, balance of payments basis
119	Germany	Household disposable income, real
120	Germany	Government current disbursements, value
121	Germany	Current disbursements of households, value
122	Germany	Government current receipts, value
123	Germany	Current receipts of households, value
124	Germany	Money supply, broad definition M2 or M3
125	Germany	Claims on oth resid sector
126	Germany	HPI
127	Germany	SPI
128	Germany	Direct investment abroad
129	Germany	Dir. invest. in rep. econ., n.i.e.
130	Germany	Portfolio investment assets
131	Germany	Portfolio investment liab., n.i.e
132	Germany	Other investment assets
133	Germany	Other investment liab., n.i.e
134	Germany	Financial account, n.i.e.
135	Germany	Capacity utilization
136	Germany	Balance of income, value, balance of payments basis
137	Germany	Current account, value
138	Germany	Current account, value in US\$
139	Germany	Long-term interest rate on government bonds
140	Germany	Short-term interest rate
141	Germany	Labor force participation rate
142	Germany	Government saving(net), value

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
143	Germany	Household saving ratio
144	Germany	Unemployment rate
145	Germany	Industrial confidence
146	Germany	Consumer confidence
147	Germany	Terms of trade
148	Germany	Stock prices
149	Germany	Real compensation of employees
150	Japan	PPI
151	Japan	Real Effective exchange rate, 2000 = 100, ULC-based
152	Japan	Gross domestic product deflator
153	Japan	CPI
154	Japan	Import Unit Values / Import Prices
155	Japan	Export Unit Values / Export Prices
156	Japan	Private final consumption expenditure, volume
157	Japan	Dependent employment
158	Japan	Dependent employment of the business sector
159	Japan	Government employment
160	Japan	Self-employed
161	Japan	Total employment
162	Japan	Employment of the business sector
163	Japan	Exchange rate, index of US\$ per local currency
164	Japan	Gross domestic product, volume, market prices
165	Japan	Private non-residential fixed capital formation, volume
166	Japan	Government fixed capital formation, volume
167	Japan	Private residential fixed capital formation, volume
168	Japan	Industrial production
169	Japan	Private total fixed capital formation, volume
170	Japan	Gross total fixed capital formation, volume
171	Japan	Labor force
172	Japan	Imports of goods and services, volume, national accounts basis
173	Japan	Money supply, broad definition: M2 or M3
174	Japan	Factor income paid abroad, volume, balance of payments basis
175	Japan	Labor productivity of the total economy
176	Japan	Unit labor cost of the manufacturing sector
177	Japan	Unemployment
178	Japan	Wage rate of the manufacturing sector, hourly earnings
179	Japan	Exports of goods and services, volume, national accounts basis
180	Japan	Factor income from abroad, volume, balance of payments basis
181	Japan	JPN Monetary aggregate M1 sa / Quantum (non-additive or stock figures) SA \ yen
182	Japan	Claims on private sector
183	Japan	HPI
184	Japan	SPI
185	Japan	Direct investment abroad
186	Japan	Dir. invest. in rep. econ., n.i.e.
187	Japan	Portfolio investment assets
188	Japan	Portfolio investment liab., n.i.e
189	Japan	Other investment liab., n.i.e

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
190	Japan	Financial account, n.i.e.
191	Japan	Balance of income, value, balance of payments basis
192	Japan	Current account, value
193	Japan	Current account, value in US\$
194	Japan	Long-term interest rate on government bonds
195	Japan	Short-term interest rate
196	Japan	Increase in stocks, volume
197	Japan	Labor force participation rate
198	Japan	Unemployment rate
199	Japan	Velocity of money
200	Japan	Terms of trade
201	Japan	Industrial confidence
202	Japan	Stock prices
203	Netherlands	Real Effective exchange rate, 2000 = 100, ULC-based
204	Netherlands	Gross domestic product, deflator, market prices
205	Netherlands	CPI
206	Netherlands	Import Unit Values / Import Prices
207	Netherlands	Export Unit Values / Export Prices
208	Netherlands	Government consumption of fixed capital, value
209	Netherlands	Private final consumption expenditure, volume
210	Netherlands	Total employment
211	Netherlands	Exchange rate, index of US\$ per local currency
212	Netherlands	Gross domestic product, volume, market prices
213	Netherlands	Private non-residential fixed capital formation, volume
214	Netherlands	Fixed investment in non-residential construction, volume
215	Netherlands	Fixed investment in construction, volume
216	Netherlands	Government fixed capital formation, volume
217	Netherlands	Private residential fixed capital formation, volume
218	Netherlands	Fixed investment in machinery & equipment, volume
219	Netherlands	Industrial production
220	Netherlands	Private total fixed capital formation, volume
221	Netherlands	Gross total fixed capital formation, volume
222	Netherlands	Labor force
223	Netherlands	Imports of goods and services, volume, national accounts basis
224	Netherlands	Labor productivity of the total economy
225	Netherlands	Unit labor cost of the total economy
226	Netherlands	Unit labor cost of the manufacturing sector
227	Netherlands	Wage rate of the manufacturing sector, hourly earnings
228	Netherlands	Exports of goods and services, volume, national accounts basis
229	Netherlands	Government current disbursements, value
230	Netherlands	Government current receipts, value
231	Netherlands	Money supply, broad definition: M2 or M3
232	Netherlands	Claims on private sector
233	Netherlands	HPI
234	Netherlands	SPI
235	Netherlands	TFP growth
236	Netherlands	Direct investment abroad
237	Netherlands	Dir. invest. in rep. econ., n.i.e.

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
238	Netherlands	Portfolio investment assets
239	Netherlands	Portfolio investment liab., n.i.e
240	Netherlands	Other investment assets
241	Netherlands	Other investment liab., n.i.e
242	Netherlands	Financial account, n.i.e.
243	Netherlands	Capacity utilization
244	Netherlands	Balance of income, value, balance of payments basis
245	Netherlands	Current account, value
246	Netherlands	Current account, value in US\$
247	Netherlands	Long-term interest rate on government bonds
248	Netherlands	Short-term interest rate \ PERCENT
249	Netherlands	Increase in stocks, volume
250	Netherlands	Labor force participation rate
251	Netherlands	Government saving(net), value
252	Netherlands	Unemployment rate
253	Netherlands	Consumer confidence
254	Netherlands	Terms of trade
255	Netherlands	Stock prices
256	UK	PPI
257	UK	Real Effective exchange rate, 2000 = 100, ULC-based
258	UK	Gross domestic product deflator
259	UK	CPI
260	UK	Import Unit Values / Import Prices
261	UK	Export Unit Values / Export Prices
262	UK	Government consumption of fixed capital, value
263	UK	Private final consumption expenditure, volume
264	UK	Dependent employment
265	UK	Dependent employment of the business sector
266	UK	Government employment
267	UK	Self-employed
268	UK	Total employment
269	UK	Employment of the business sector
270	UK	Exchange rate, index of US\$ per local currency
271	UK	Gross domestic product, constant prices
272	UK	Private non-residential fixed capital formation, volume
273	UK	Government fixed capital formation, volume
274	UK	Private residential fixed capital formation, volume
275	UK	Industrial production
276	UK	Private total fixed capital formation, volume
277	UK	Gross total fixed capital formation, volume
278	UK	Labor force
279	UK	Imports of goods and services, volume, national accounts basis
280	UK	Labor productivity of the total economy
281	UK	Household saving, value
282	UK	Current transfers received by households, value
283	UK	Unit labor cost of the total economy
284	UK	Unit labor cost of the manufacturing sector
285	UK	Unemployment

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
286	UK	Wages, value
287	UK	Wage rate of the business sector
288	UK	Compensation rate of government employees
289	UK	Wage rate of the manufacturing sector, hourly earnings
290	UK	Compensation rate of the business sector
291	UK	Compensation of employees, value
292	UK	Exports of goods and services, volume, national accounts basis
293	UK	Household disposable income, real
294	UK	Property income received by households, value
295	UK	Government current disbursements, value
296	UK	Current disbursements of households, value
297	UK	Government current receipts, value
298	UK	Current receipts of households, value
299	UK	Self-employment income received by households, value
300	UK	Money supply, broad definition: M2 or M3
301	UK	Claims on private sector
302	UK	HPI
303	UK	SPI
304	UK	Fixed investment of government enterprises, volume
305	UK	Direct investment abroad
306	UK	Dir. invest. in rep. econ., n.i.e.
307	UK	Portfolio investment assets
308	UK	Portfolio investment liab., n.i.e
309	UK	Other investment assets
310	UK	Other investment liab., n.i.e
311	UK	Financial account, n.i.e.
312	UK	Capacity utilization
313	UK	Balance of income, value, balance of payments basis
314	UK	Current account, value
315	UK	Current account, value in US\$
316	UK	Long-term interest rate on government bonds
317	UK	Short-term interest rate
318	UK	Increase in stocks, volume
319	UK	Labor force participation rate
320	UK	Government saving(net), value
321	UK	Household saving ratio
322	UK	Unemployment rate
323	UK	Industrial confidence
324	UK	Terms of trade
325	UK	Consumer confidence
326	USA	Real Effective exchange rate, 2000 = 100, ULC-based
327	USA	Gross domestic product deflator
328	USA	CPI
329	USA	Import Unit Values / Import Prices
330	USA	Export Unit Values / Export Prices
331	USA	Private final consumption expenditure, volume
332	USA	Dependent employment
333	USA	Dependent employment of the business sector

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
334	USA	Government employment
335	USA	Self-employed
336	USA	Total employment
337	USA	Employment of the business sector
338	USA	Gross domestic product, constant prices
339	USA	Private non-residential fixed capital formation, volume
340	USA	Fixed investment in non-residential construction, volume
341	USA	Fixed investment in construction, volume
342	USA	Government fixed capital formation, volume
343	USA	Private residential fixed capital formation, volume
344	USA	Fixed investment in machinery & equipment, volume
345	USA	Industrial production
346	USA	Private total fixed capital formation, volume
347	USA	Gross total fixed capital formation, volume
348	USA	Labor force
349	USA	Imports of goods and services, volume, national accounts basis
350	USA	Labor productivity of the total economy
351	USA	Current transfers received by households, value
352	USA	Unit labor cost of the total economy
353	USA	Unit labor cost of the manufacturing sector
354	USA	Unemployment
355	USA	Wages, value
356	USA	Wages of the government sector, value
357	USA	Wage rate of the business sector
358	USA	Compensation rate of government employees
359	USA	Wage rate of the manufacturing sector, hourly earnings
360	USA	Compensation rate of the business sector
361	USA	Compensation of employees, value
362	USA	Exports of goods and services, volume, national accounts basis
363	USA	Household disposable income, real
364	USA	Property income received by households, value
365	USA	Government current disbursements, value
366	USA	Current disbursements of households, value
367	USA	Government current receipts, value
368	USA	Current receipts of households, value
369	USA	Self-employment income received by households, value
370	USA	USA Monetary aggregate M1 sa / Quantum (non-additive or stock figures) SA \ dollars
371	USA	USA Monetary aggregate M2 sa / Quantum (non-additive or stock figures) SA \ dollars
372	USA	Claims on private sector
373	USA	HPI
374	USA	SPI
375	USA	Direct investment abroad
376	USA	Dir. invest. in rep. econ., n.i.e.
377	USA	Portfolio investment assets
378	USA	Portfolio investment liab., n.i.e
379	USA	Other investment assets
380	USA	Other investment liab., n.i.e

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
381	USA	Financial account, n.i.e.
382	USA	Balance of income, value, balance of payments basis
383	USA	Current account, value in US\$
384	USA	Long-term interest rate on government bonds
385	USA	Long-term interest rate on corporate bonds
386	USA	Short-term interest rate
387	USA	Increase in stocks, volume
388	USA	Labor force participation rate
389	USA	Government saving(net), value
390	USA	Household saving, value
391	USA	Household saving ratio
392	USA	Unemployment rate
393	USA	Velocity of money
394	USA	Manufacturing - Industrial confidence indicator
395	USA	Consumer confidence indicator
396	USA	Terms of trade
	Trade by Destination	
397	France	Imports from Euro
398	Trade by destination	Imports from EU
399		Imports from EU ascension countries
400		Imports from Canada
401		Imports from United States
402		Imports from United Kingdom
403		Imports from Japan
404		Imports from China, P.R.: Mainland
405		Imports from Asia
406		Imports from Latam
407		Imports from ROW
408		Exports to Euro
409		Exports to EU
410		Exports to EU ascension ctrys
411		Exports to Canada
412		Exports to United States
413		Exports to United Kingdom
414		Exports to Japan
415		Exports to China, P.R.: Mainland
416		Exports to Asia
417		Exports to Latam
418		Exports to ROW
419	Germany	Imports from Euro
420	Trade by destination	Imports from EU
421		Imports from EU ascension ctrys
422		Imports from Canada
423		Imports from United States
424		Imports from United Kingdom
425		Imports from Japan
426		Imports from China, P.R.: Mainland

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
427		Imports from Asia
428		Imports from Latam
429		Imports from ROW
430		Exports to Euro
431		Exports to EU
432		Exports to EU ascension ctrys
433		Exports to Canada
434		Exports to United States
435		Exports to United Kingdom
436		Exports to Japan
437		Exports to China, P.R.: Mainland
438		Exports to Asia
439		Exports to Latam
440		Exports to ROW
441	Japan	Imports from Euro
442	Trade by destination	Imports from EU
443		Imports from EU ascension ctrys
444		Imports from Canada
445		Imports from United States
446		Imports from United Kingdom
447		Imports from China, P.R.: Mainland
448		Imports from Asia
449		Imports from Latam
450		Imports from ROW
451		Exports to Euro
452		Exports to EU
453		Exports to EU ascension ctrys
454		Exports to Canada
455		Exports to United States
456		Exports to United Kingdom
457		Exports to China, P.R.: Mainland
458		Exports to Asia
459		Exports to Latam
460		Exports to ROW
461	Netherlands	Imports from Euro
462	Trade by destination	Imports from EU
463		Imports from EU ascension ctrys
464		Imports from Canada
465		Imports from United States
466		Imports from United Kingdom
467		Imports from Japan
468		Imports from China, P.R.: Mainland
469		Imports from Asia
470		Imports from Latam
471		Imports from ROW
472		Exports to Euro
473		Exports to EU
474		Exports to EU ascension ctrys

Annex I. Macroeconomic Series

Series No.	Country/Region	Variable Name
475		Exports to Canada
476		Exports to United States
477		Exports to United Kingdom
478		Exports to Japan
479		Exports to China, P.R.: Mainland
480		Exports to Asia
481		Exports to Latam
482		Exports to ROW
483	USA	Imports from Euro
484	Trade by destination	Imports from EU
485		Imports from EU ascension ctrys
486		Imports from Canada
487		Imports from United Kingdom
488		Imports from Japan
489		Imports from China, P.R.: Mainland
490		Imports from Asia
491		Imports from Latam
492		Imports from ROW
493		Exports to Euro
494		Exports to EU
495		Exports to EU ascension ctrys
496		Exports to Canada
497		Exports to United Kingdom
498		Exports to Japan
499		Exports to China, P.R.: Mainland
500		Exports to Asia
501		Exports to Latam
502		Exports to ROW
	Trade by Product	
397	France	IMP SITC Total
398	Trade by product	IMP SITC 0: Food and live animal
399		IMP SITC 1: Beverages and tobacco
400		IMP SITC 2: Crude materials, inedible, except fuels
401		IMP SITC 3: Mineral fuels, lubricants and related materials
402		IMP SITC 4: Animal and vegetable oils, fats and waxes
403		IMP SITC 5: Chemicals and related products, n.e.s.
404		IMP SITC 6: Manufactured goods
405		IMP SITC 7: Machinery and transport equipment
406		IMP SITC 8: Miscellaneous manufactured articles
407		IMP SITC 9: Commodities and transactions n.e.c.
408		EXP SITC Total
409		EXP SITC 0: Food and live animal
410		EXP SITC 1: Beverages and tobacco
411		EXP SITC 2: Crude materials, inedible, except fuels
412		EXP SITC 3: Mineral fuels, lubricants and related materials
413		EXP SITC 4: Animal and vegetable oils, fats and waxes
414		EXP SITC 5: Chemicals and related products, n.e.s.

Annex I. Macroeconomic Series

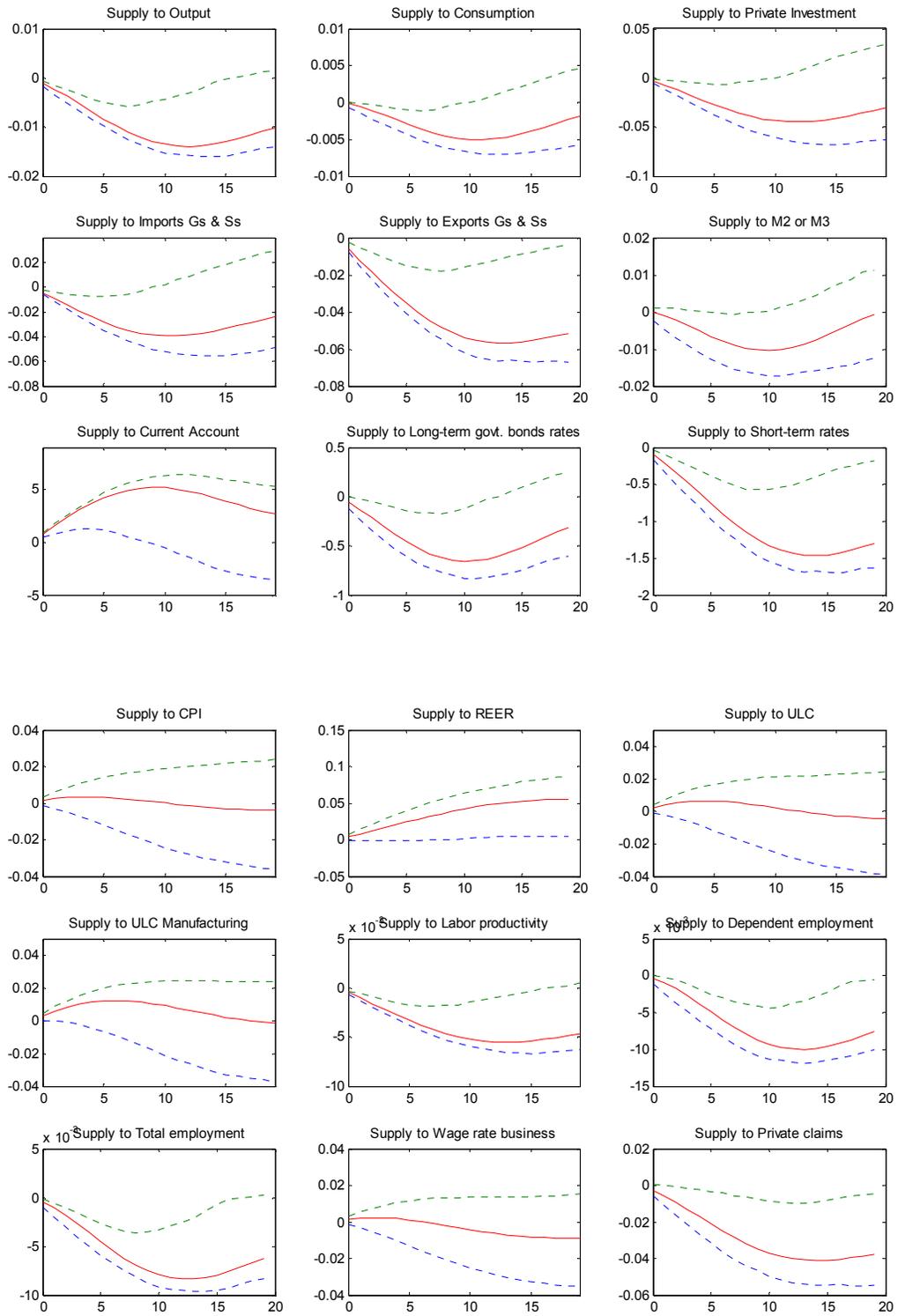
Series No.	Country/Region	Variable Name
415		EXP SITC 6: Manufactured goods
416		EXP SITC 7: Machinery and transport equipment
417		EXP SITC 8: Miscellaneous manufactured articles
418		EXP SITC 9: Commodities and transactions n.e.c.
419	Germany	IMP SITC Total
420	Trade by product	IMP SITC 0: Food and live animal
421		IMP SITC 1: Beverages and tobacco
422		IMP SITC 2: Crude materials, inedible, except fuels
423		IMP SITC 3: Mineral fuels, lubricants and related materials
424		IMP SITC 4: Animal and vegetable oils, fats and waxes
425		IMP SITC 5: Chemicals and related products, n.e.s.
426		IMP SITC 6: Manufactured goods - Germany
427		IMP SITC 7: Machinery and transport equipment
428		IMP SITC 8: Miscellaneous manufactured articles
429		IMP SITC 9: Commodities and transactions n.e.c.
430		EXP SITC Total
431		EXP SITC 0: Food and live animal
432		EXP SITC 1: Beverages and tobacco
433		EXP SITC 2: Crude materials, inedible, except fuels
434		EXP SITC 3: Mineral fuels, lubricants and related materials
435		EXP SITC 4: Animal and vegetable oils, fats and waxes
436		EXP SITC 5: Chemicals and related products, n.e.s.
437		EXP SITC 6: Manufactured goods
438		EXP SITC 7: Machinery and transport equipment
439		EXP SITC 8: Miscellaneous manufactured articles
440		EXP SITC 9: Commodities and transactions n.e.c.
441	Japan	IMP SITC Total
442	Trade by product	IMP SITC 0: Food and live animal
443		IMP SITC 1: Beverages and tobacco
444		IMP SITC 2: Crude materials, inedible, except fuels
445		IMP SITC 3: Mineral fuels, lubricants and related materials
446		IMP SITC 4: Animal and vegetable oils, fats and waxes
447		IMP SITC 5: Chemicals and related products, n.e.s.
448		IMP SITC 6: Manufactured goods - Japan
449		IMP SITC 7: Machinery and transport equipment
450		IMP SITC 8: Miscellaneous manufactured articles
451		IMP SITC 9: Commodities and transactions n.e.c.
452		EXP SITC Total
453		EXP SITC 0: Food and live animal
454		EXP SITC 1: Beverages and tobacco
455		EXP SITC 2: Crude materials, inedible, except fuels
456		EXP SITC 3: Mineral fuels, lubricants and related materials
457		EXP SITC 4: Animal and vegetable oils, fats and waxes
458		EXP SITC 5: Chemicals and related products, n.e.s.
459		EXP SITC 6: Manufactured goods
460		EXP SITC 7: Machinery and transport equipment
461		EXP SITC 8: Miscellaneous manufactured articles
462		EXP SITC 9: Commodities and transactions n.e.c.

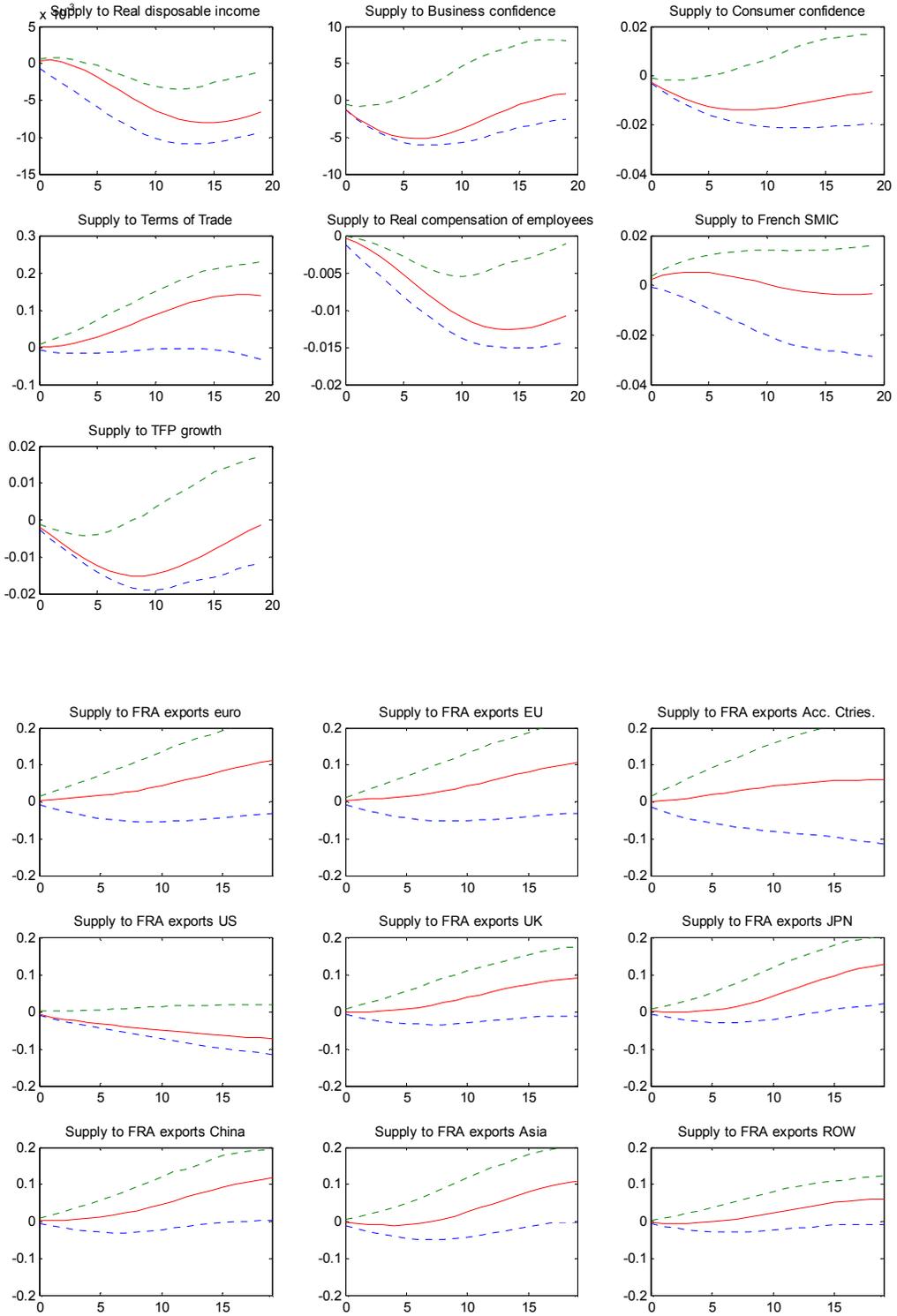
Annex I. Macroeconomic Series

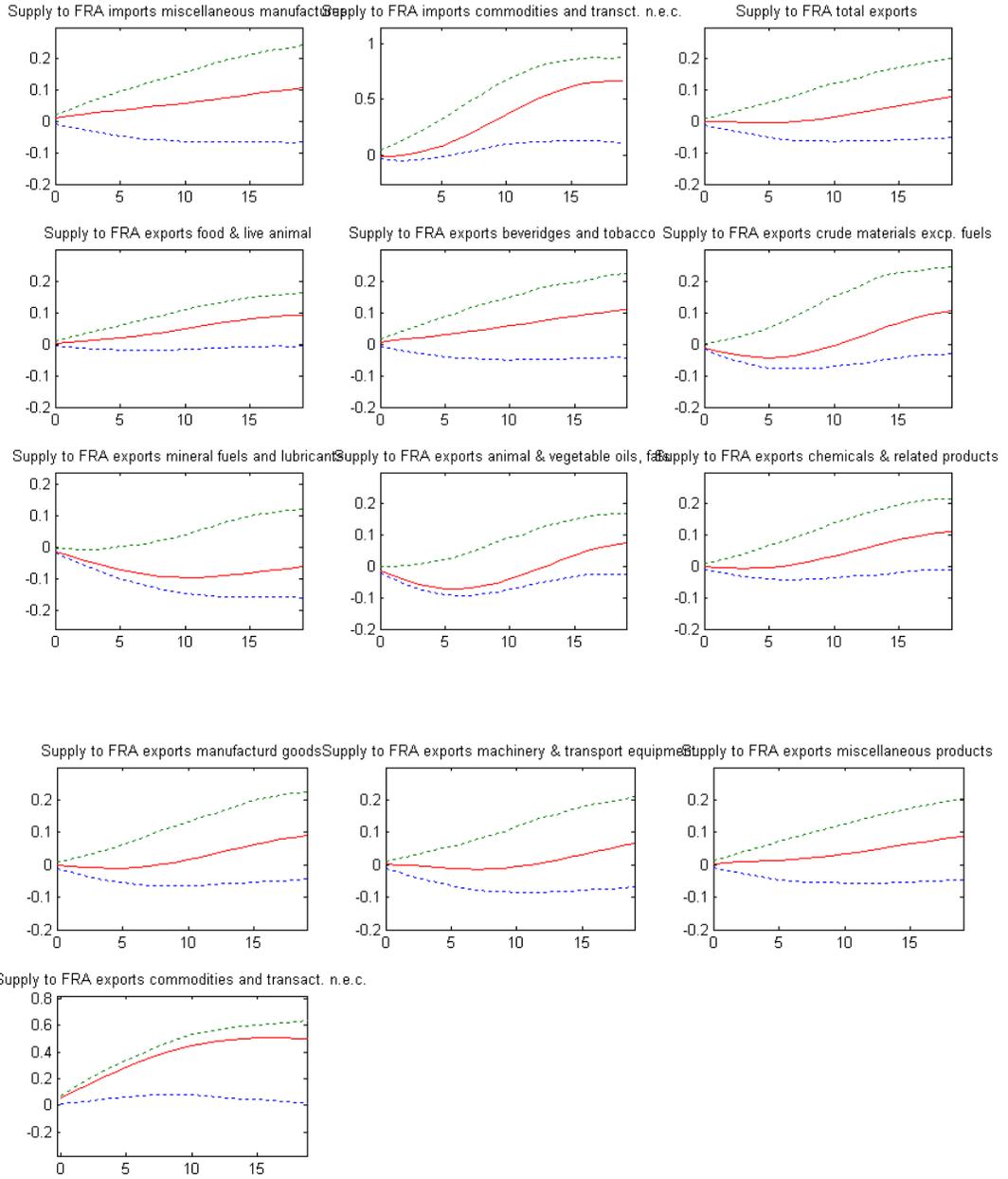
Series No.	Country/Region	Variable Name
463	Netherlands	IMP SITC Total
464	Trade by product	IMP SITC 0: Food and live animal
465		IMP SITC 1: Beverages and tobacco
466		IMP SITC 2: Crude materials, inedible, except fuels
467		IMP SITC 3: Mineral fuels, lubricants and related materials
468		IMP SITC 4: Animal and vegetable oils, fats and waxes
469		IMP SITC 5: Chemicals and related products, n.e.s.
470		IMP SITC 6: Manufactured goods
471		IMP SITC 7: Machinery and transport equipment
472		IMP SITC 8: Miscellaneous manufactured articles
473		IMP SITC 9: Commodities and transactions n.e.c.
474		EXP SITC Total
475		EXP SITC 0: Food and live animal
476		EXP SITC 1: Beverages and tobacco
477		EXP SITC 2: Crude materials, inedible, except fuels
478		EXP SITC 3: Mineral fuels, lubricants and related materials
479		EXP SITC 4: Animal and vegetable oils, fats and waxes
480		EXP SITC 5: Chemicals and related products, n.e.s.
481		EXP SITC 6: Manufactured goods
482		EXP SITC 7: Machinery and transport equipment
483		EXP SITC 8: Miscellaneous manufactured articles
484		EXP SITC 9: Commodities and transactions n.e.c.
485	USA	IMP SITC Total
486	Trade by product	IMP SITC 0: Food and live animal
487		IMP SITC 1: Beverages and tobacco
488		IMP SITC 2: Crude materials, inedible, except fuels
489		IMP SITC 3: Mineral fuels, lubricants and related materials
490		IMP SITC 4: Animal and vegetable oils, fats and waxes
491		IMP SITC 5: Chemicals and related products, n.e.s.
492		IMP SITC 6: Manufactured goods
493		IMP SITC 7: Machinery and transport equipment
494		IMP SITC 8: Miscellaneous manufactured articles
495		IMP SITC 9: Commodities and transactions n.e.c.
496		EXP SITC Total
497		EXP SITC 0: Food and live animal
498		EXP SITC 1: Beverages and tobacco
499		EXP SITC 2: Crude materials, inedible, except fuels
500		EXP SITC 3: Mineral fuels, lubricants and related materials
501		EXP SITC 4: Animal and vegetable oils, fats and waxes
502		EXP SITC 5: Chemicals and related products, n.e.s.
503		EXP SITC 6: Manufactured goods
504		EXP SITC 7: Machinery and transport equipment
505		EXP SITC 8: Miscellaneous manufactured articles
506		EXP SITC 9: Commodities and transactions n.e.c.

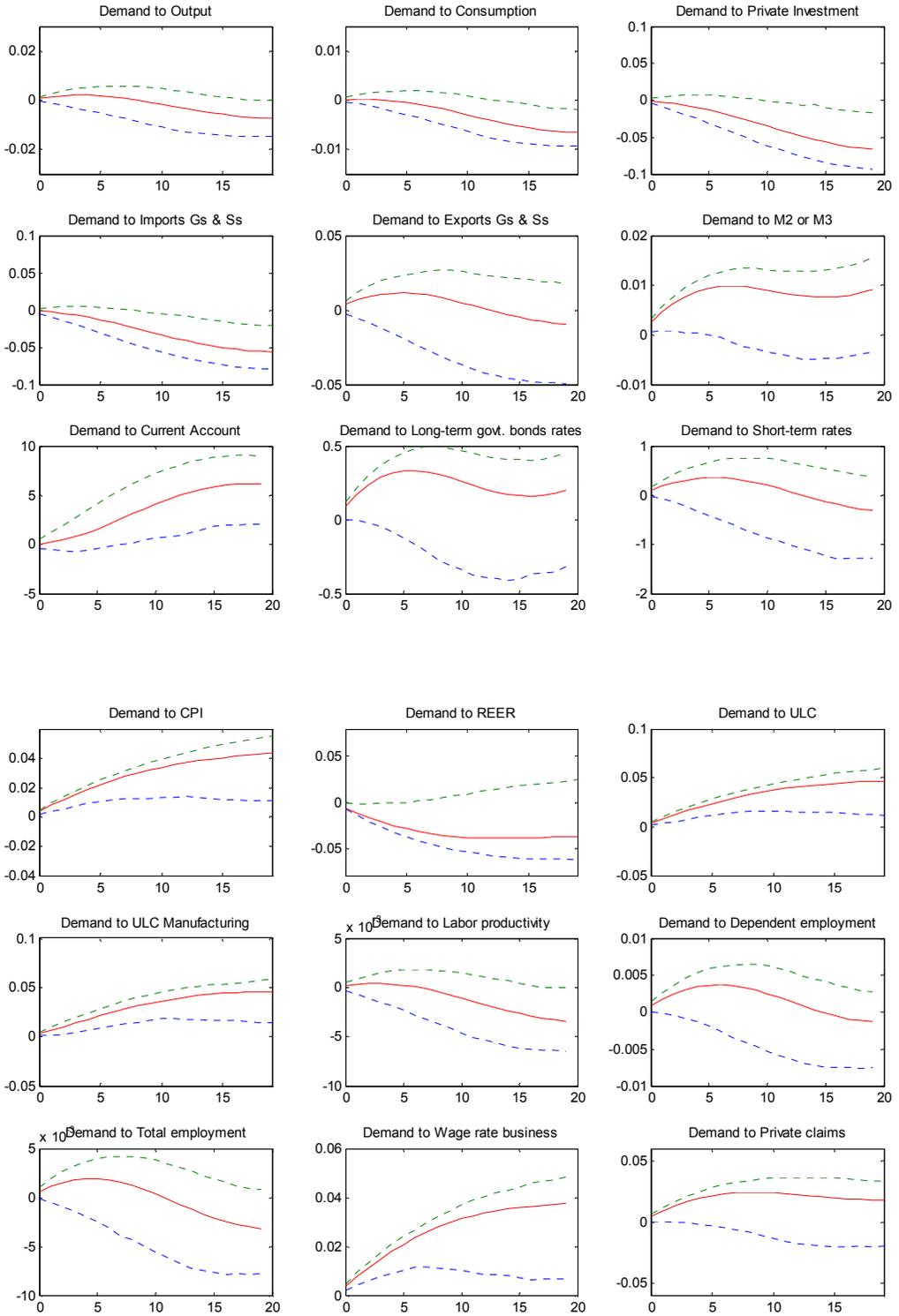
Annex II. France and Germany: Shocks to ULCM and TOT

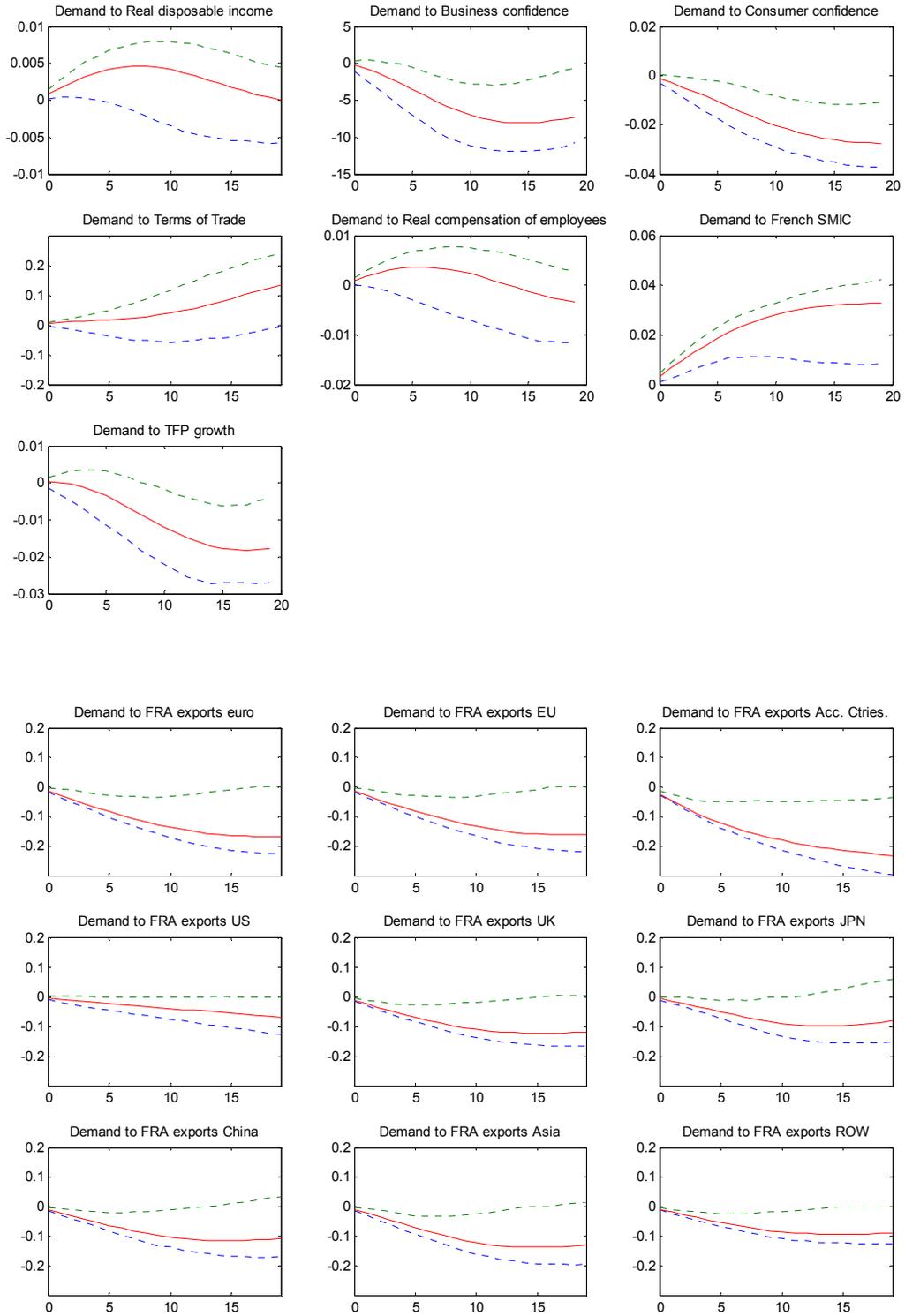
France: Shocks to ULCM

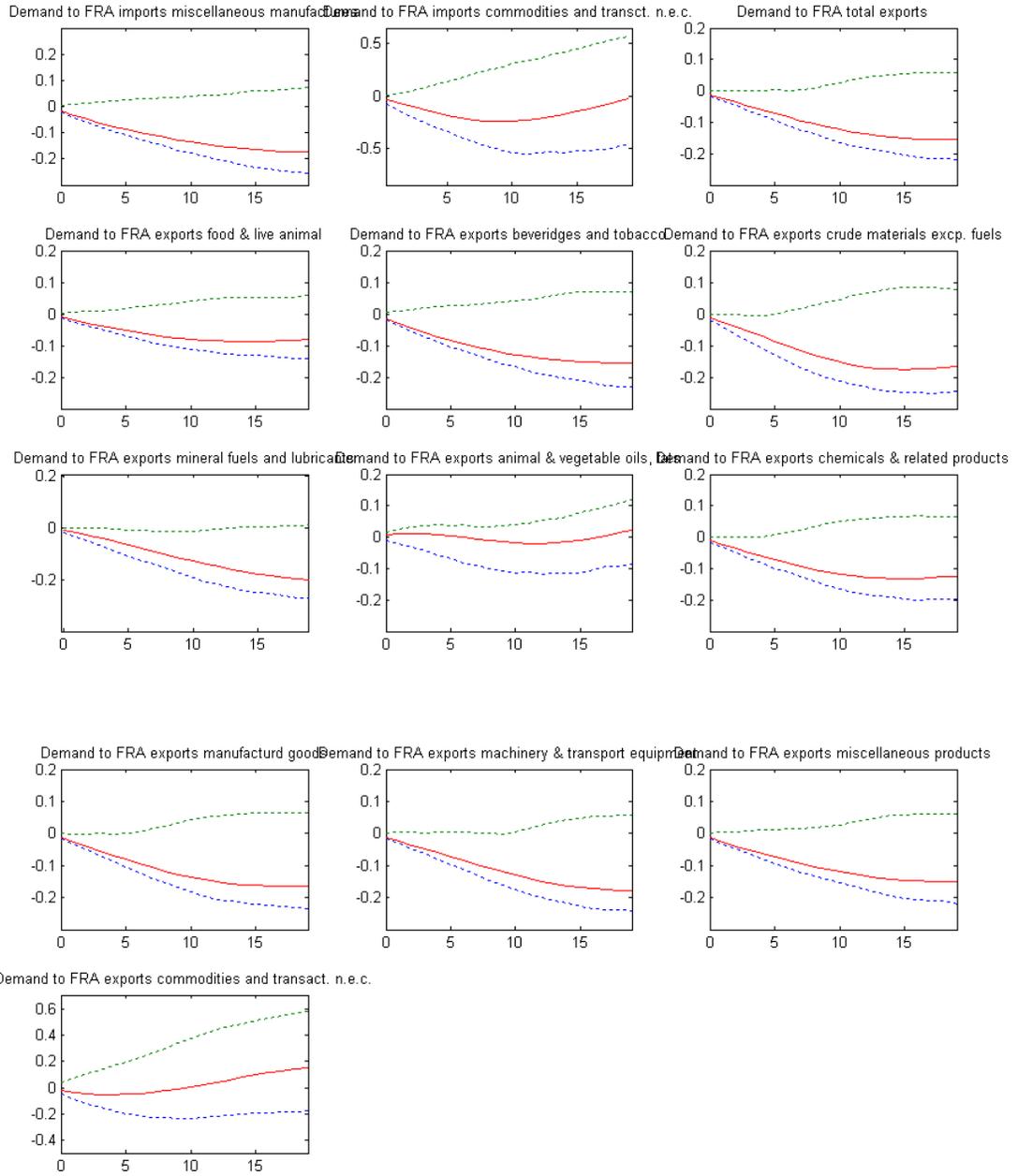




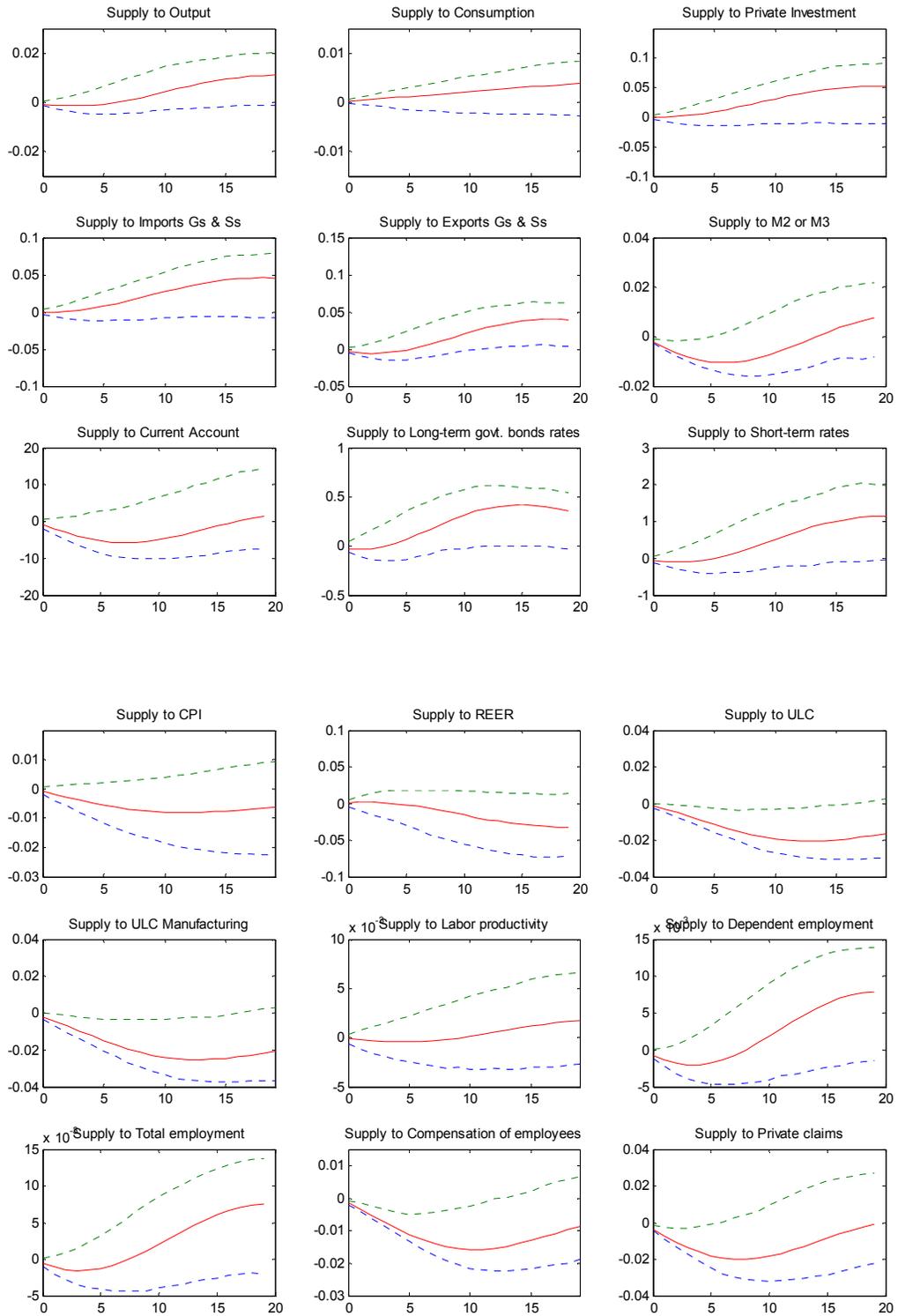


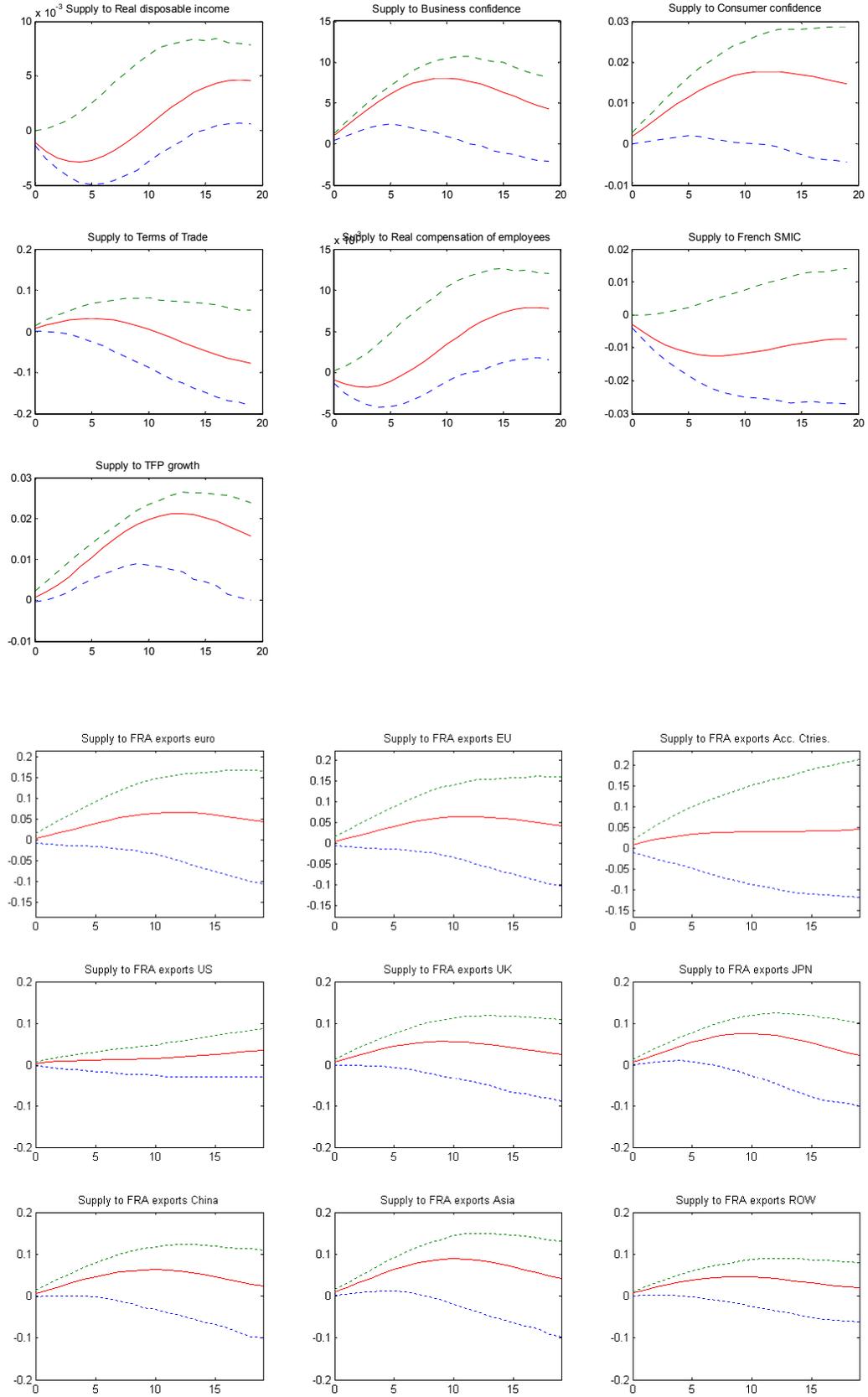


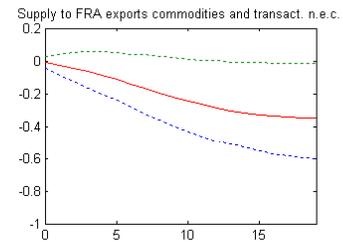
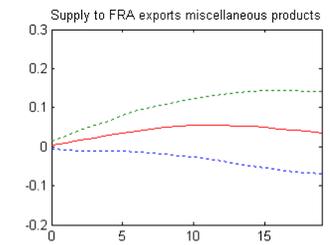
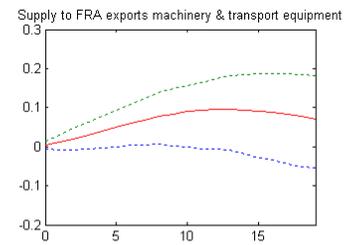
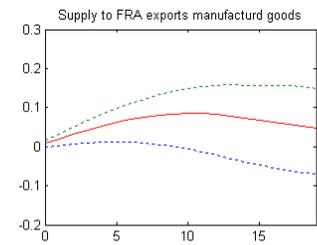
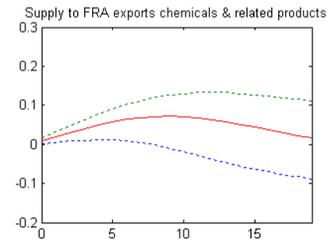
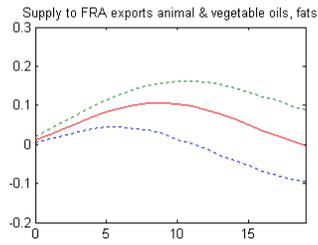
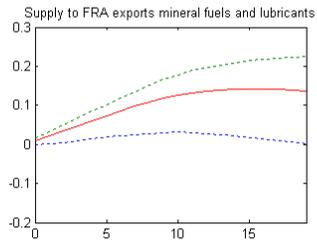
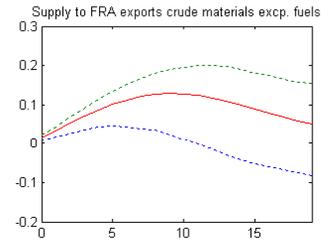
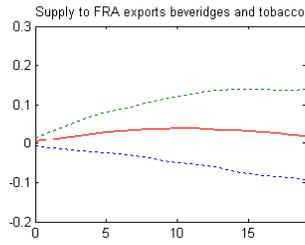
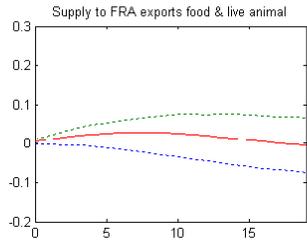
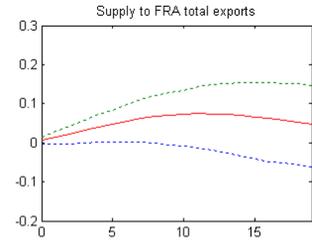
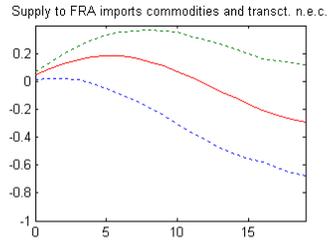
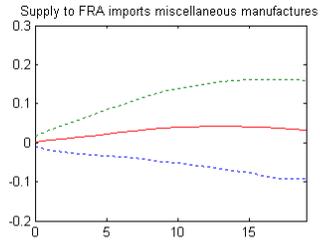


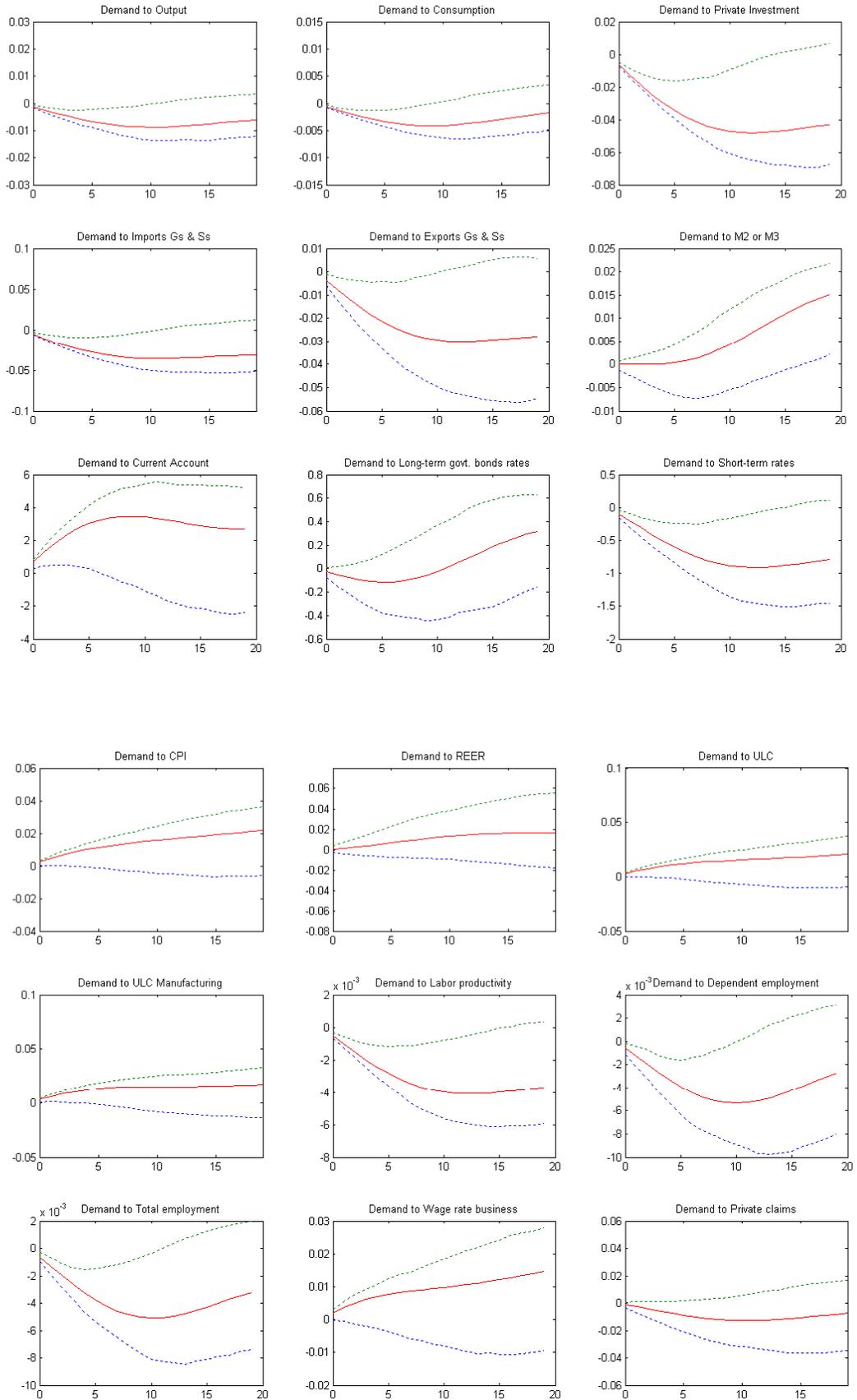


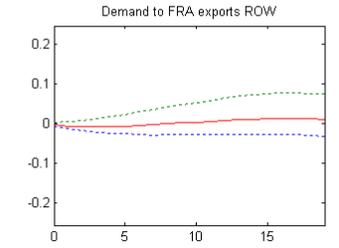
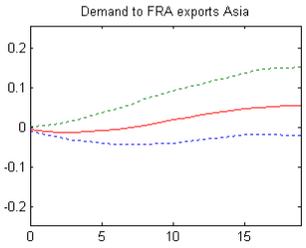
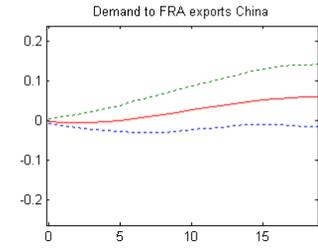
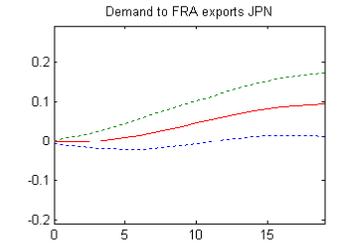
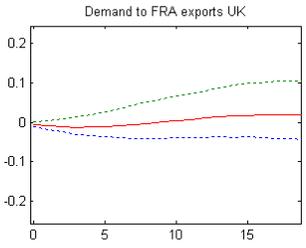
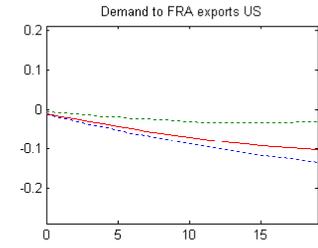
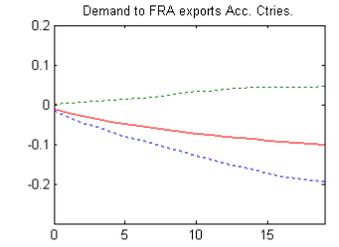
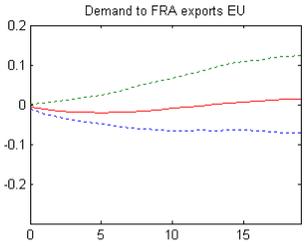
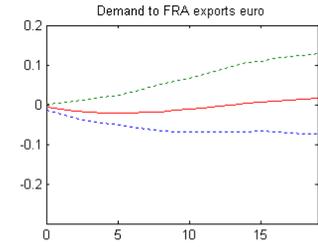
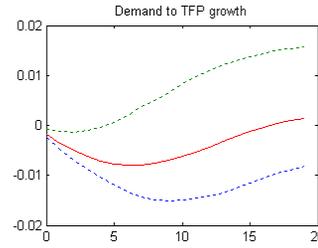
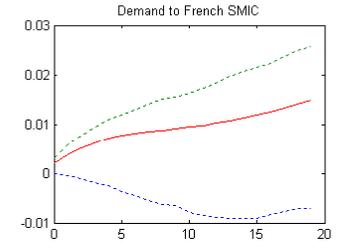
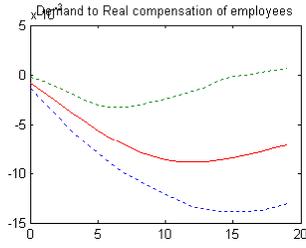
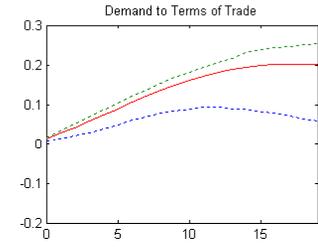
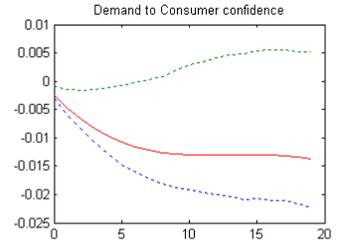
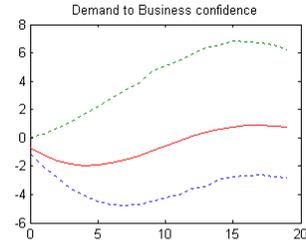
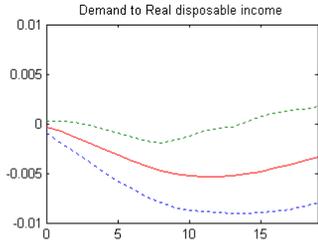
France: Shocks to TOT

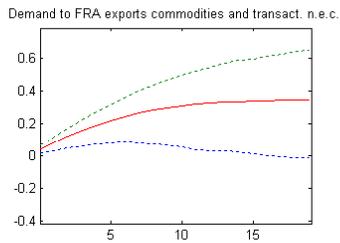
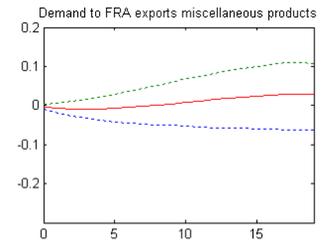
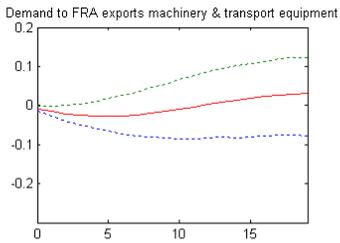
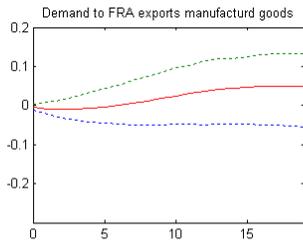
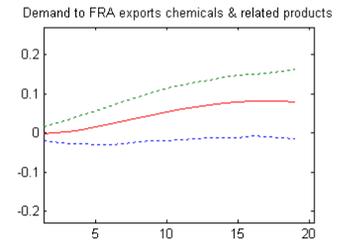
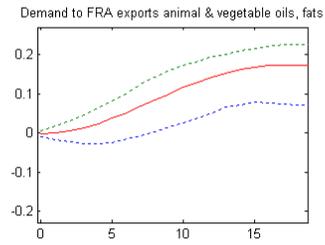
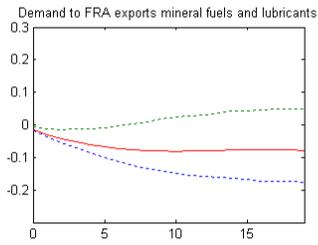
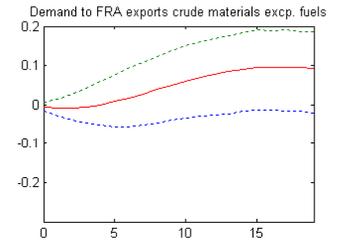
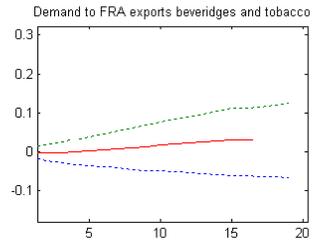
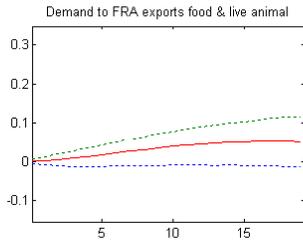
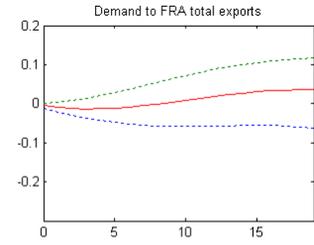
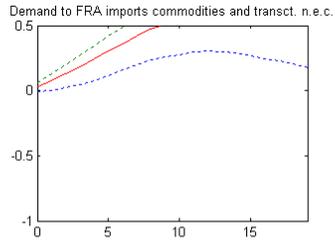
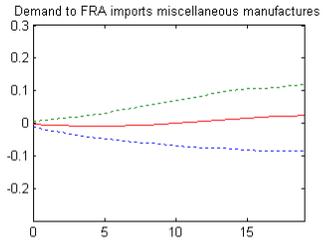




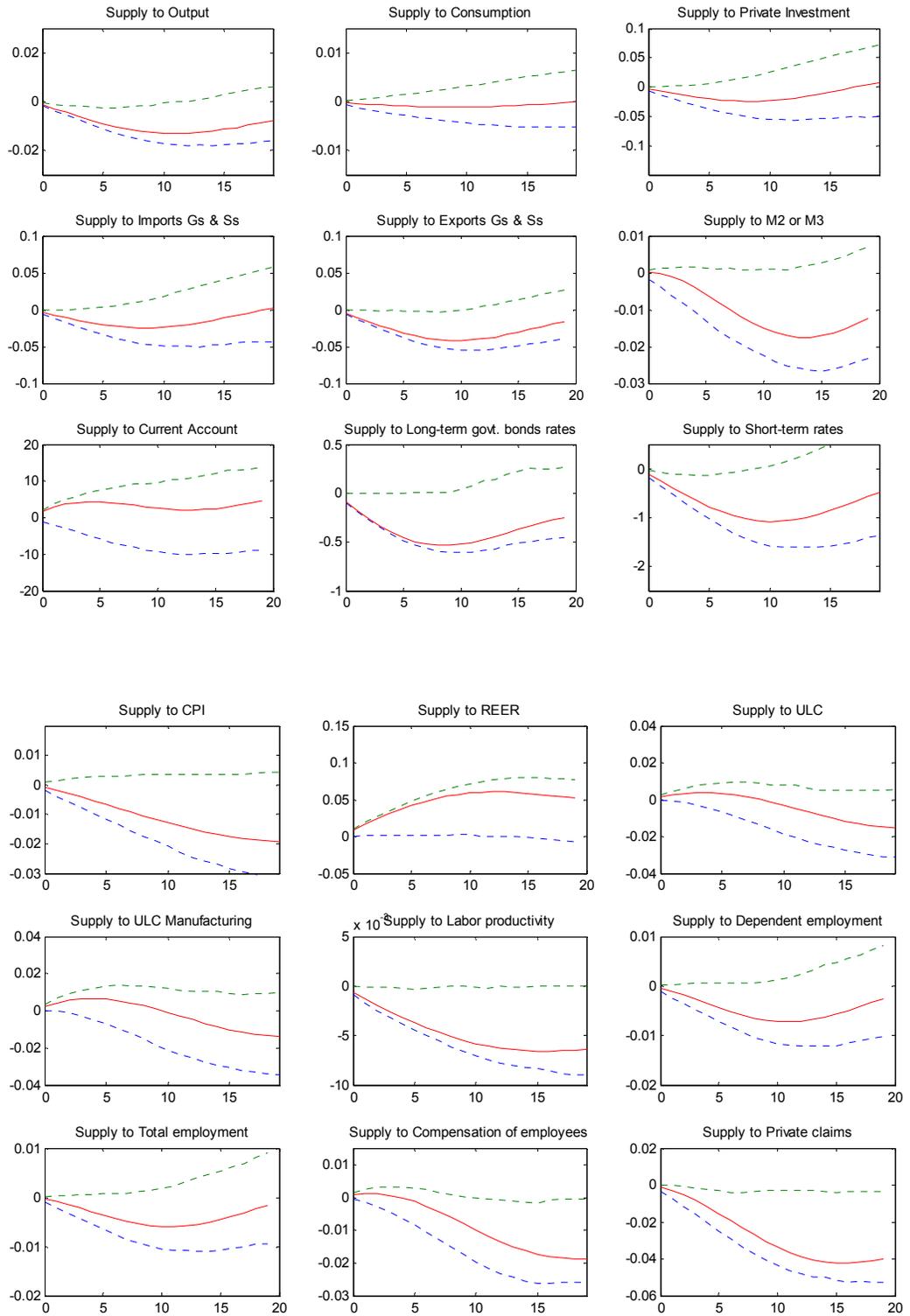


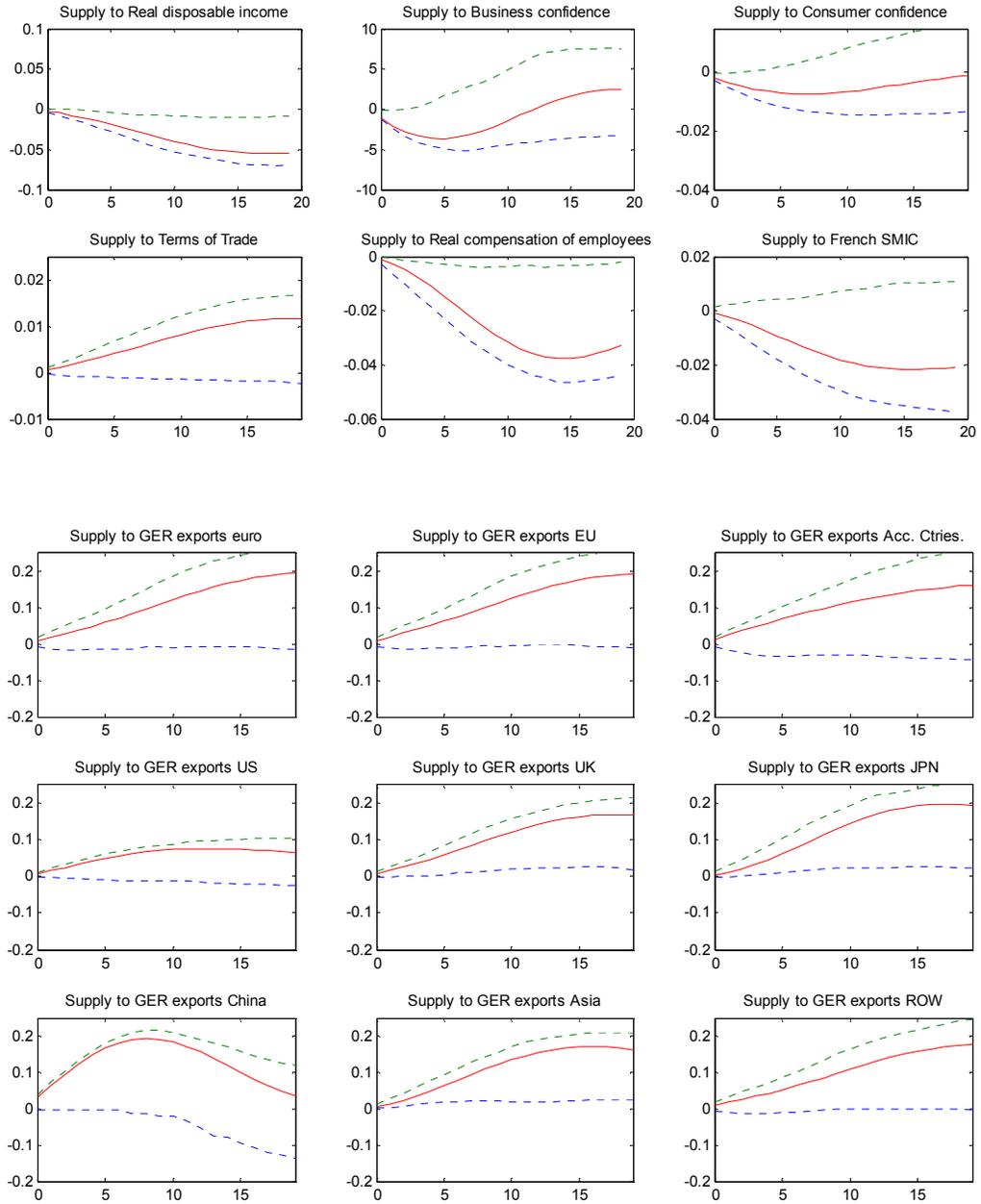


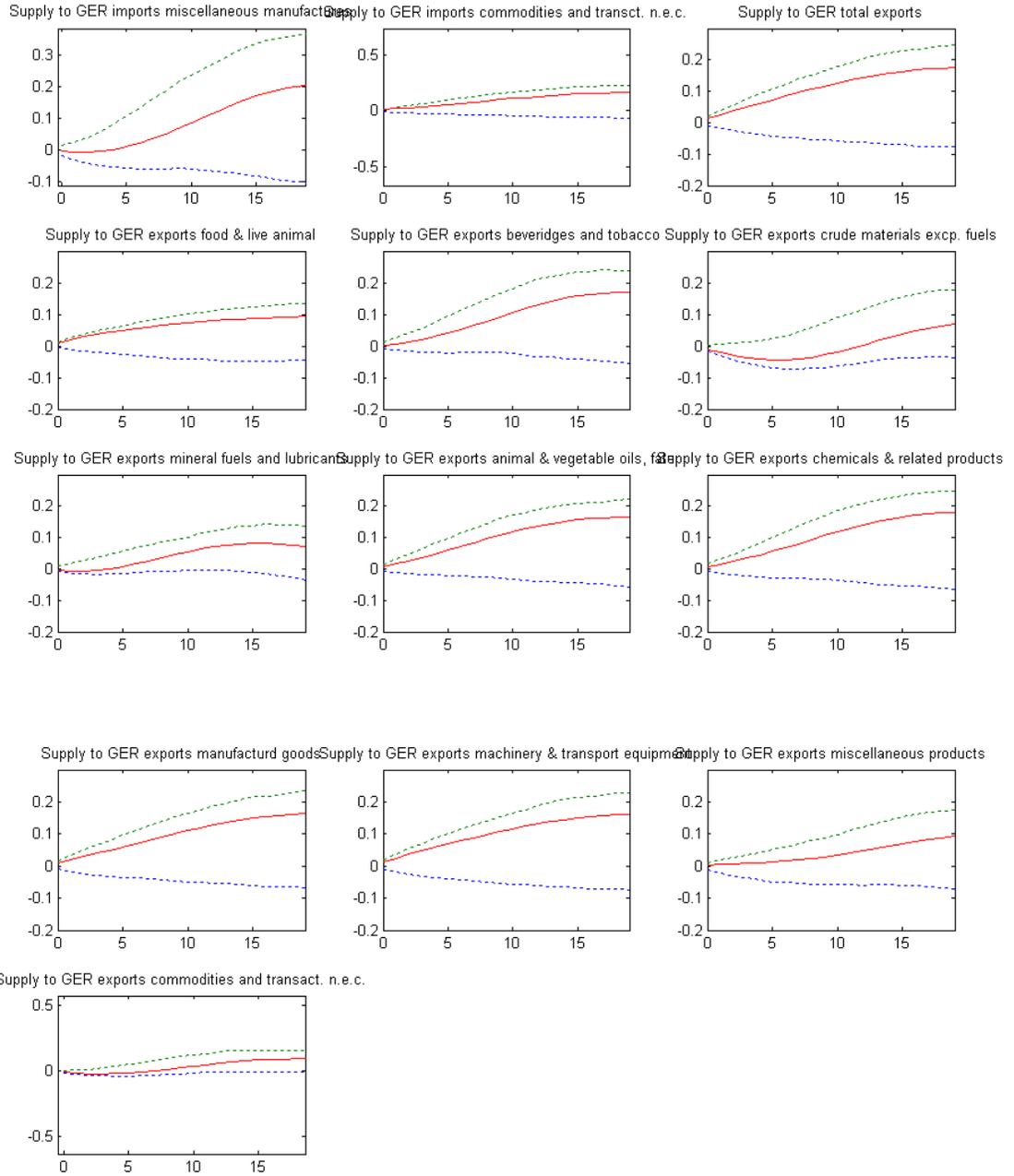


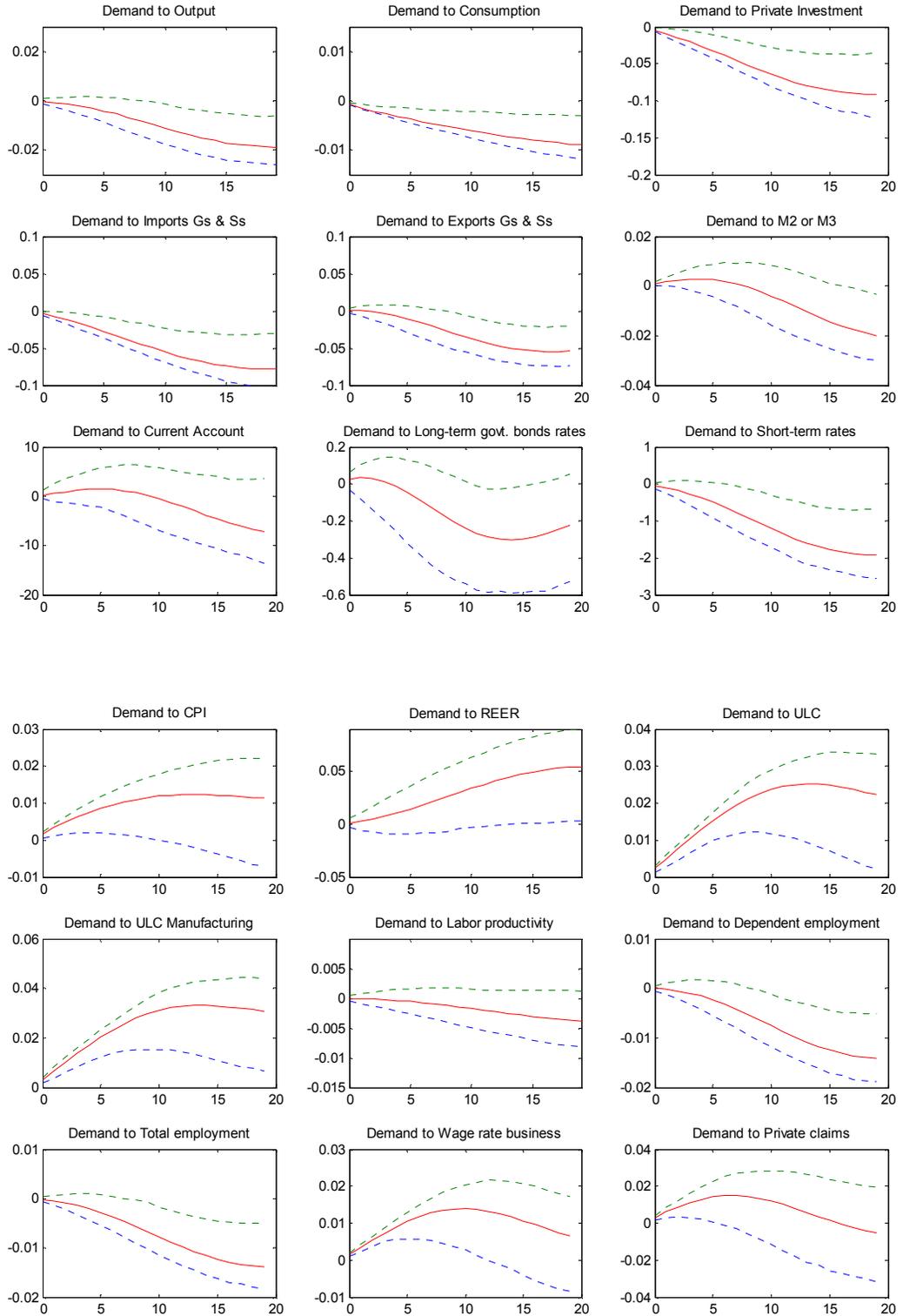


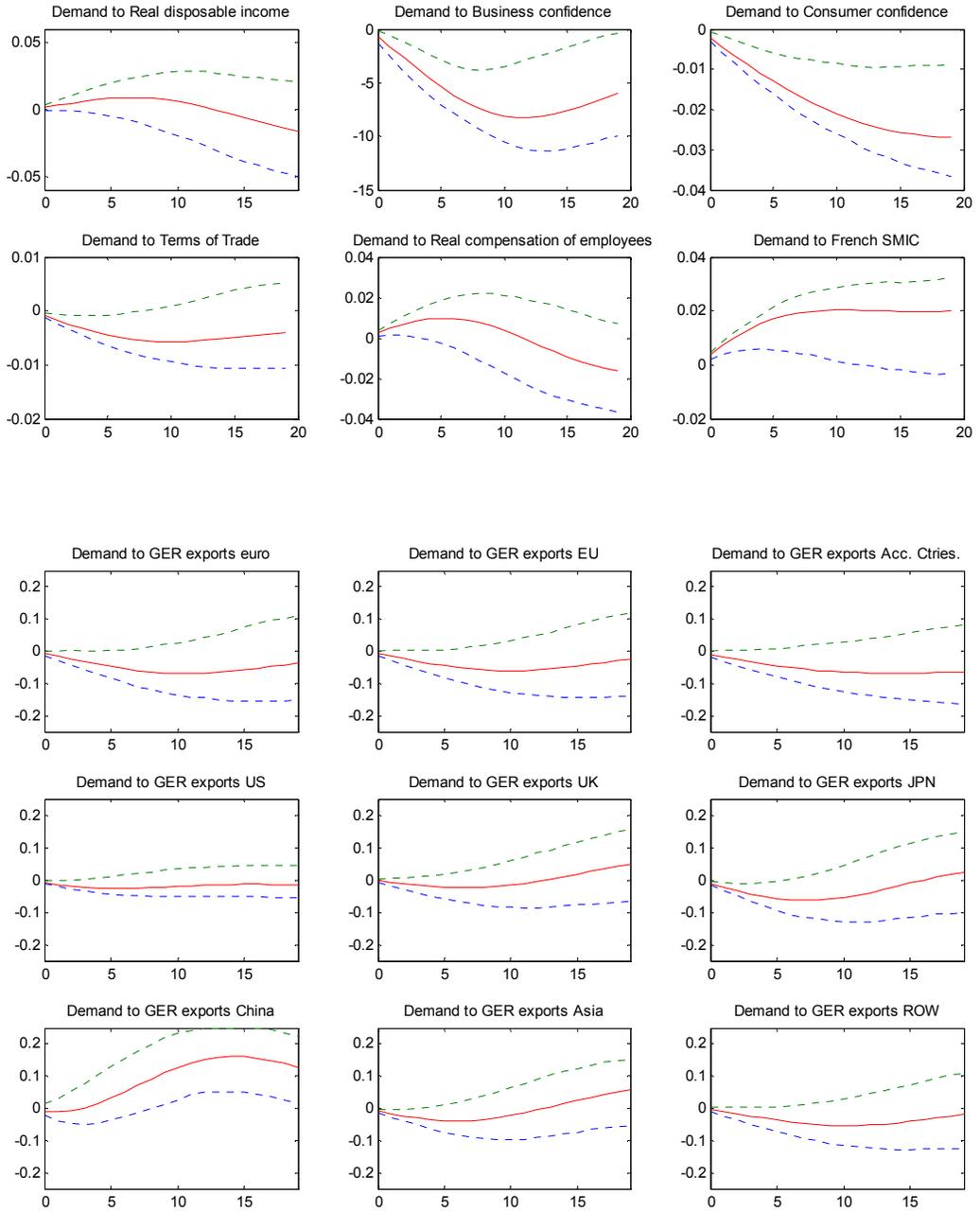
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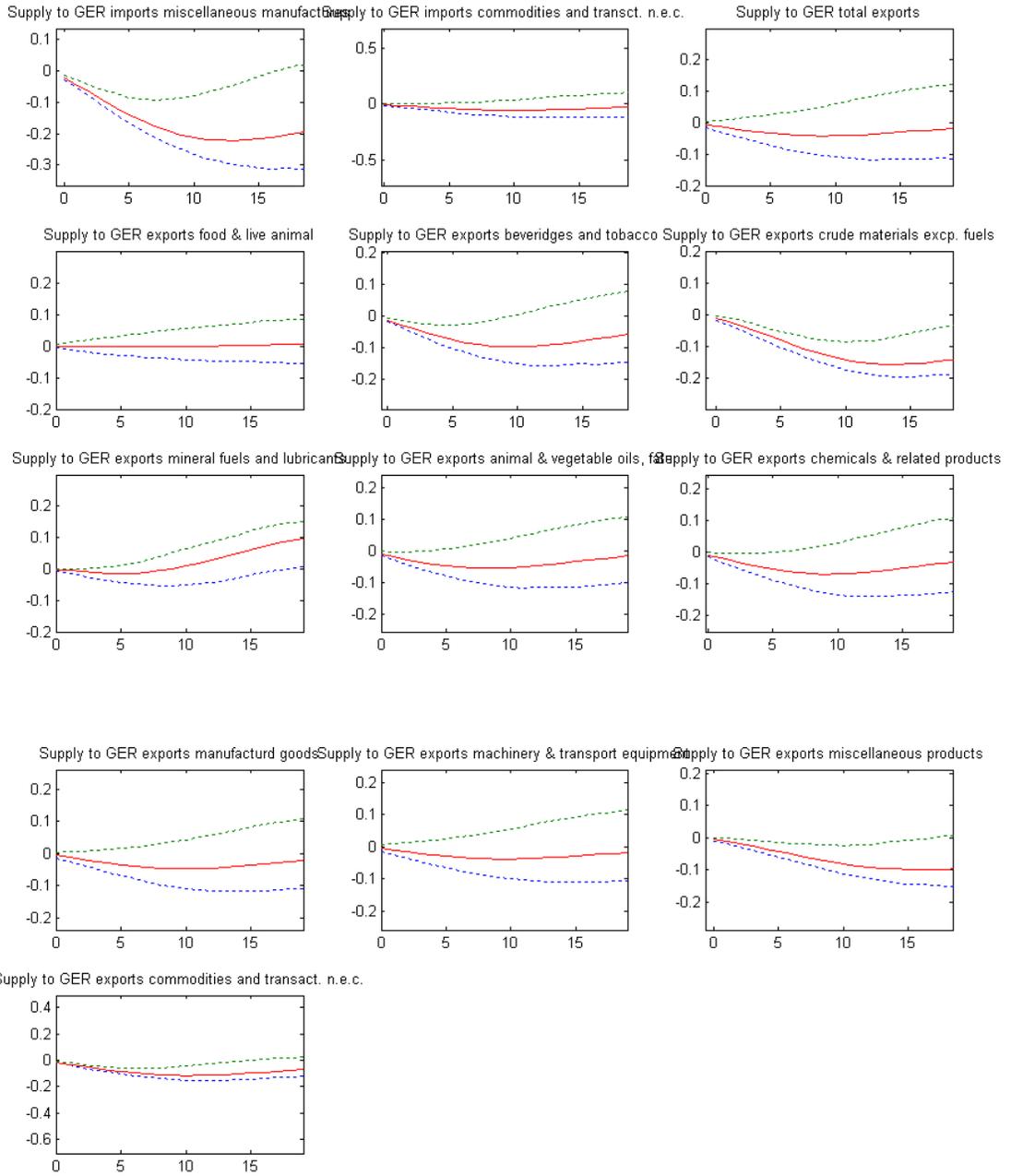




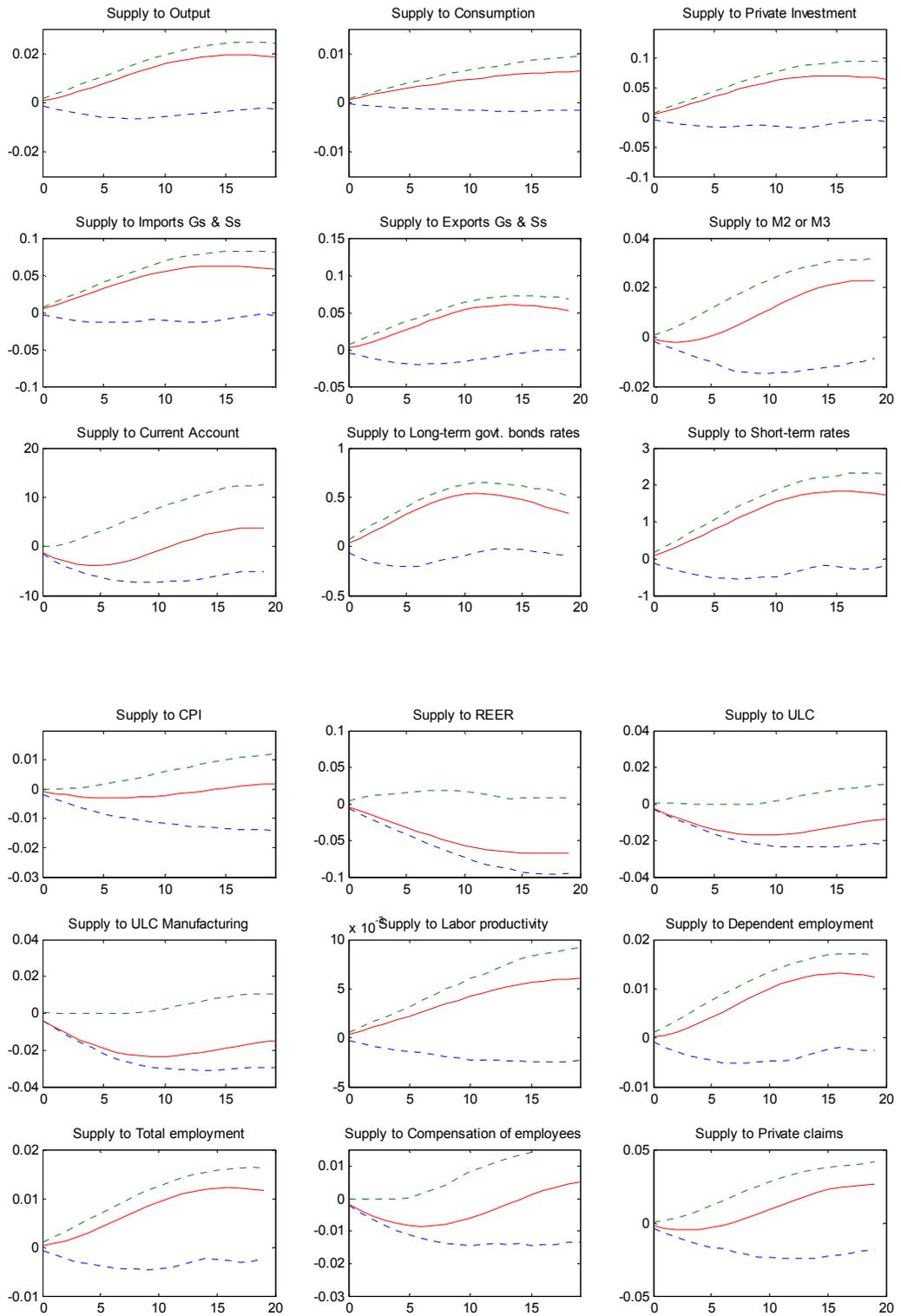


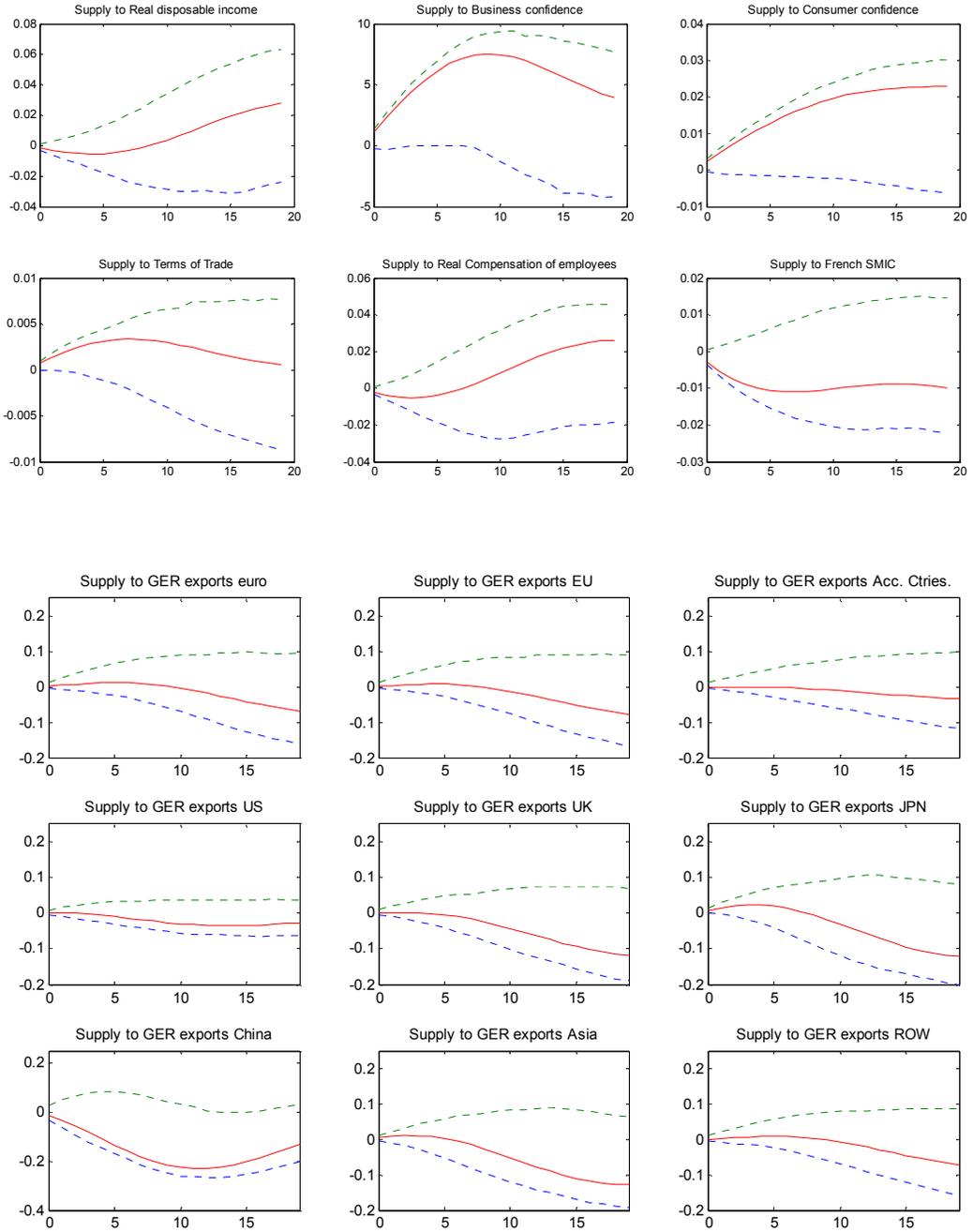


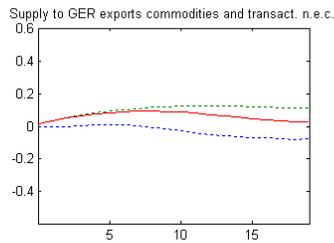
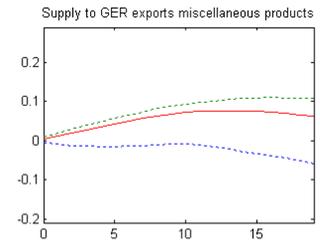
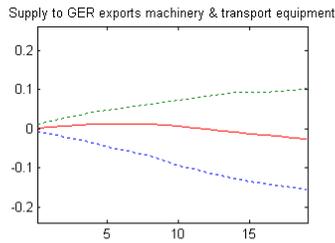
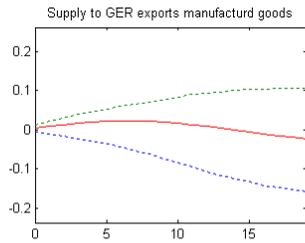
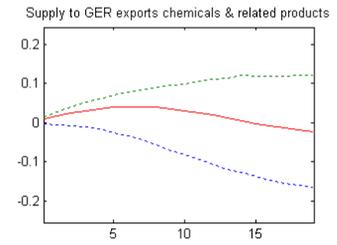
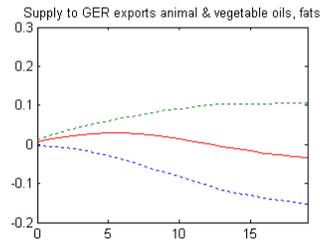
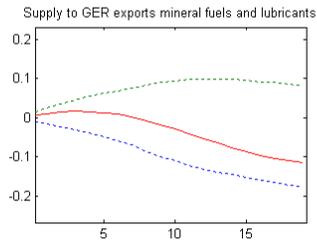
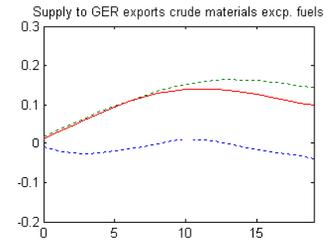
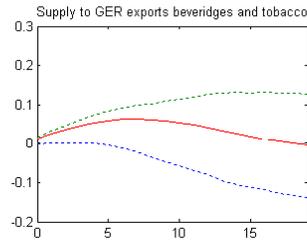
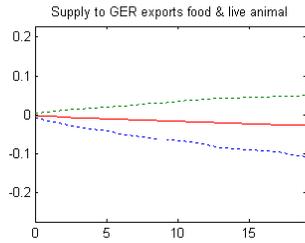
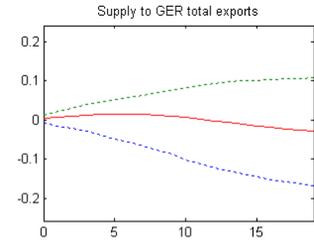
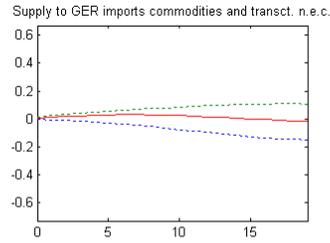
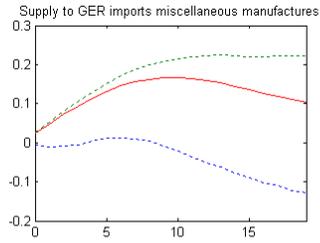


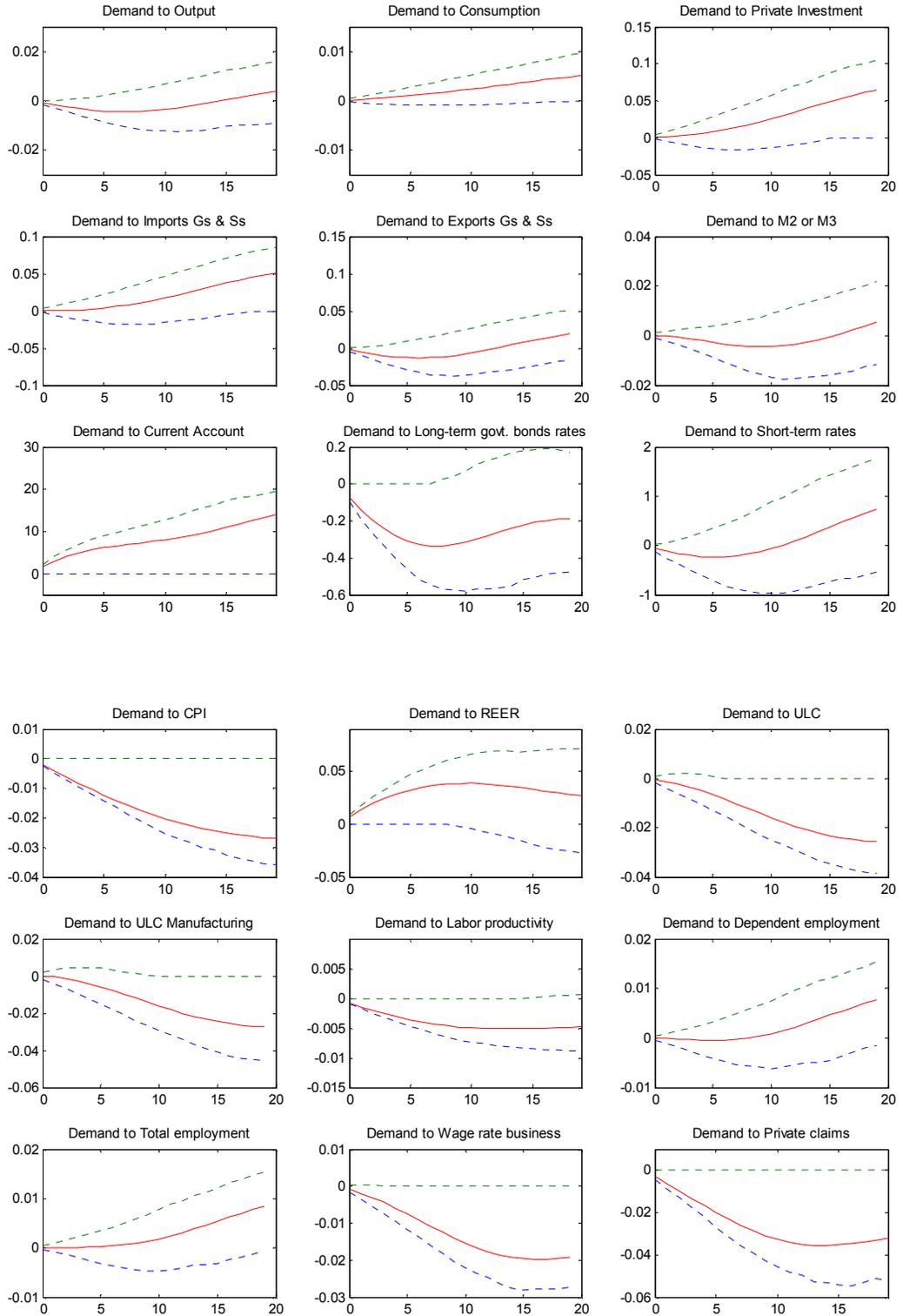


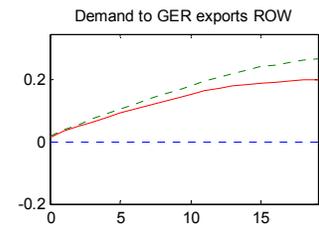
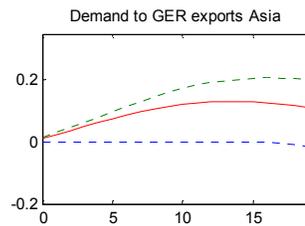
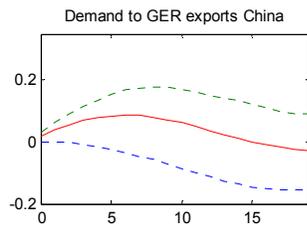
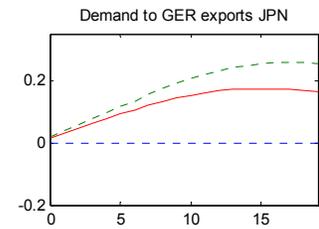
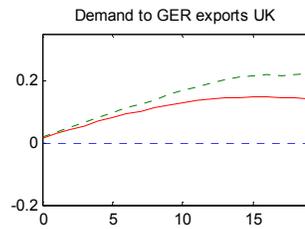
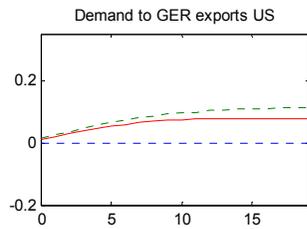
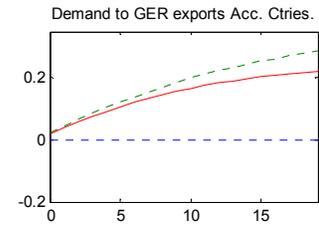
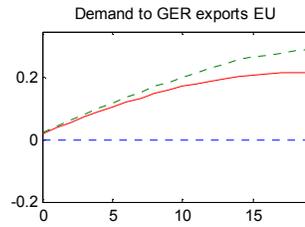
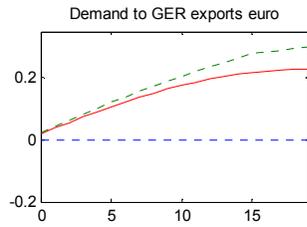
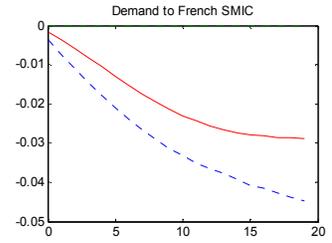
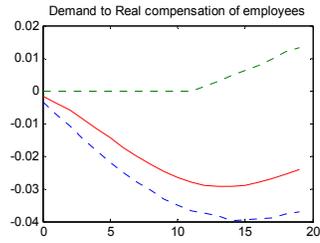
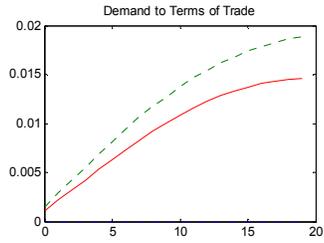
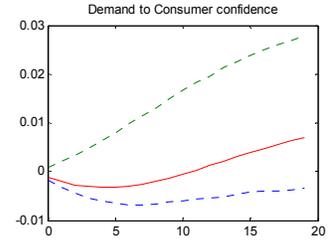
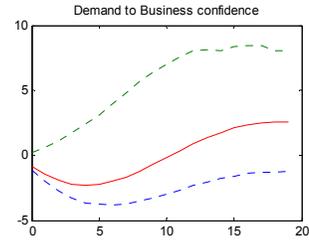
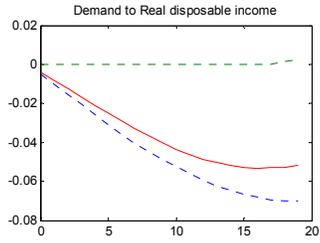
Germany: Shocks to TOT

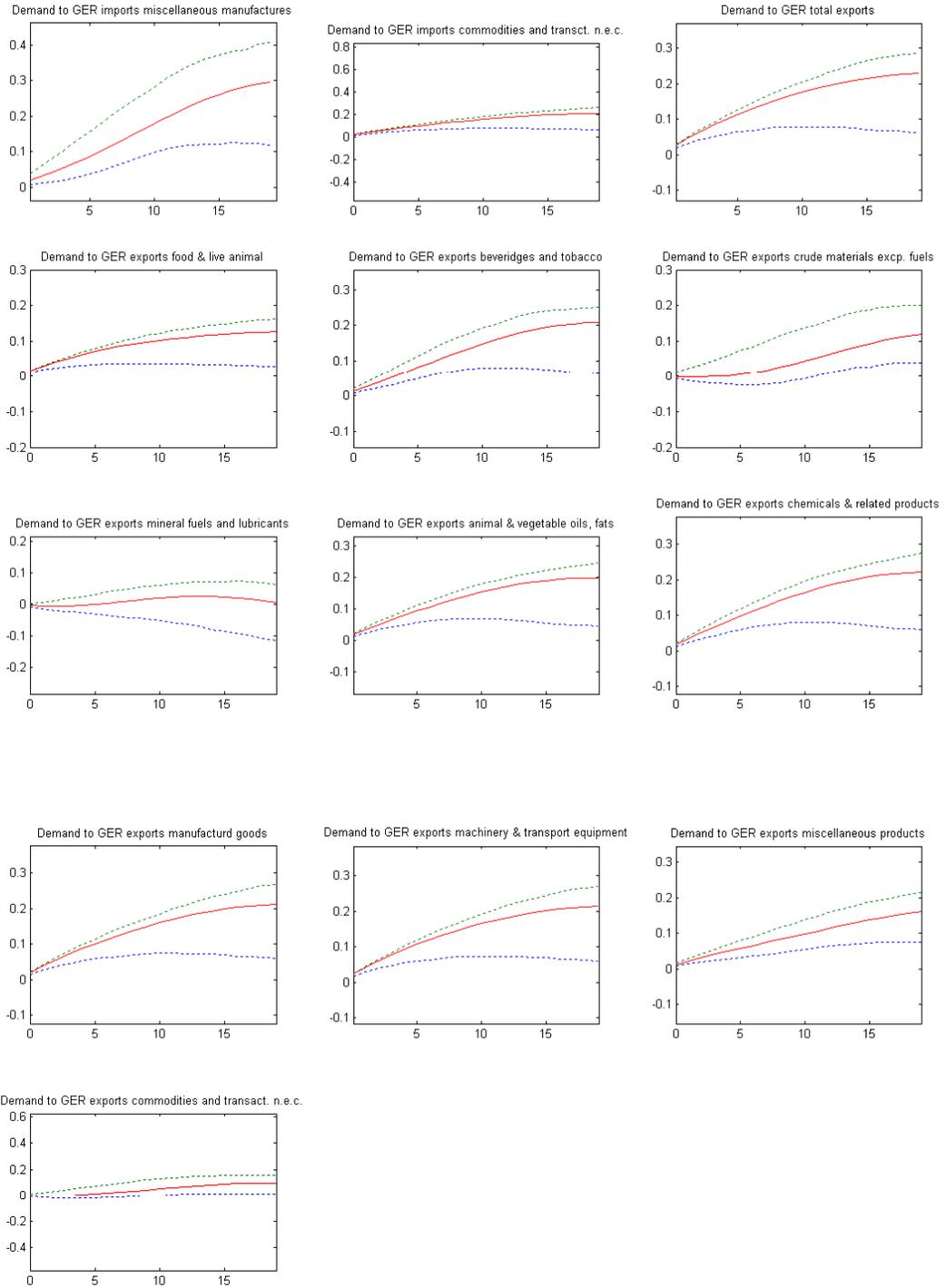












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