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IV. Common and Idiosyncratic Components of the French Business Cycle[31]

A. Introduction

58. Most macroeconomic aggregates seem to comove, and in certain cases even seem to be synchronized in that turning points occur at roughly the same point in time, or differ by roughly constant intervals. This observation led Burns and Mitchell (1946) to develop the idea of a *reference cycle*. As national accounts were developed and real GDP became the best available measure of aggregate economic activity, understanding comovements and synchronization of macroeconomic aggregates within a country as well as across countries became a major theme in theory, practice, and policy discussions. The objective of this chapter is to dissect the French real GDP cycle into its common and idiosyncratic components.[32] The main finding is that there is a great deal of synchronization between the French cycle and the rest of the world and Europe. The French idiosyncratic component is also significant, albeit smaller than one would have surmised from looking at differences in employment behavior during what has been called "employment-rich growth" in the late 1990s.

59. The issue of French output comovement with the rest of the euro area, or the rest of world output, has drawn additional attention in light of the disparate output behavior between France and other major European economies during the last cycle. Some observers have considered it to be a one-time effect of reforms while others have suggested a more durable change in output behavior. At a European level, the outset of monetary union, the different pace of fiscal consolidation under the Stability and Growth Pact, the different degree of structural reforms, and divergences in the areas chosen for reform by several European countries, have introduced an additional sense of importance into trying to assess the quantitative impact of those changes on output behavior.

60. The next section of the chapter defines what is meant by a cycle in real GDP. This leads to a discussion of what is meant by comovements between economic time series. Section C calculates the index of concordance and the test statistic developed by Harding and Pagan (2001a, 2001b, 2002). Section D develops an approach to determine whether there is a common component among the same set of series that have been found to be synchronized. The approach is inspired by the work of Stock and Watson (1991) on coincident indicators. It is applied to determine the presence of a "world" or global common factor, and a European or regional common factor. It also identifies the idiosyncratic factors of real GDP. The results are presented in Section E. The last section concludes and discusses policy implications.

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[31] Prepared by Francisco Nadal De Simone.

[32] Henceforth, the words component and factor are used as synonyms.

B. Measuring the Cycle

61. This section will be concerned with the *level* of real GDP. A pattern of recurrent moves between phases—contractions and expansions—in the level of activity is what is normally referred to as the *classical cycle*. The analysis here will not involve any detrending, as done, for instance, in the work of Cooley and Prescott (1995), and in all the related and vast literature. The main reason for this approach is to stay as close as possible to Burns and Mitchell's methodology of dating and defining the features of business cycles. Also importantly, the approach seeks to avoid the well known problem that the detrending procedure itself alters the properties of the cycle.[33]

62. The Burns and Mitchell methodology is made operational by using the algorithm originally developed by Bry and Boschan (1971) and adapted by Harding and Pagan (2002).[34] Empirical analysis will concentrate on quarterly data for France (FR), Germany (DE), Italy (IT), the rest of the euro area (REA), and the United States (US). The seasonally-adjusted real GDP data are from the OECD database except for French GDP which is from INSEE. The sample period comprises 1975:1–2001:4.

63. The turning points in the real GDP series are shown in Figure IV.1.[35] The REA real GDP series did not have at least two peaks (troughs) and one trough (peak), and thus could not be dated. Peaks are shown as taking a value of 1 and troughs as taking a value of -1. For the US, the algorithm returns the same dates of peaks and troughs as the NBER dating. The dates for the other countries are very similar to the ones obtained by Harding and Pagan (2001b) and by WEO (2002). Although the dating of the classical cycle for G7 and European countries done by Artis, Kontolemis and Osborn (1997) used industrial production, the dates in Figure IV.1 for the European countries real GDP are not too different.

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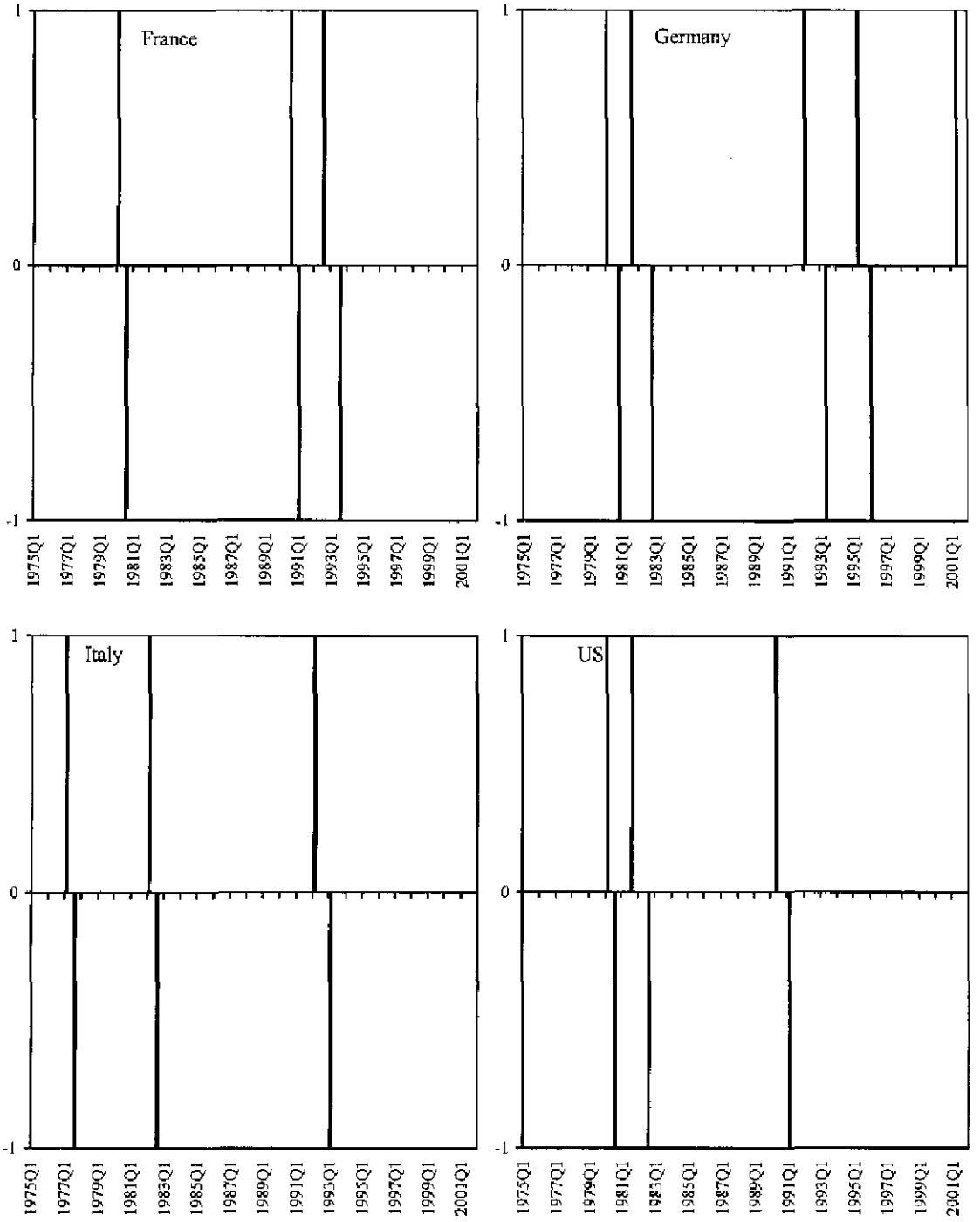
[33] See Ross and Ubide (2001) and WEO (2002) for a similar argument, and related references. Briefly, the main point is that filters such as Hodrick-Prescott or Baxter and King's band-pass remove the permanent component of a series that is nonstationary (e.g. a unit root process I(1)). The major difficulty these filtering procedures create is that the resulting stationary series (i.e., I(0) series) is not unique because any stationary series could be added to the I(1) series and it would still be I(1).

[34] The algorithm defines a peak (trough) at time t as occurring when the series $y_t > (<) y_{t+2}$. It also ensures that peaks and troughs alternate. Finally, it imposes the restriction that a cycle phase must last at least two quarters, and a complete cycle should have a minimum duration of five quarters. While the classical cycle is concerned with the *level* of real GDP, the turning points are located using *changes* in the series. Harding and Pagan (2001b) present a technical discussion.

[35] Paul Cashin's assistance in running the code is greatly appreciated. The code was used in Cashin and McDermott (2002), and is based on Watson's modified Bry-Boschan algorithm.

Figure IV.1. Turning Points of Real GDP
(Peaks=1, Troughs=-1)



Source: Staff estimates.

Cycle characteristics

64. Having determined the cycle, what follows presents statistics on duration, amplitude (or deepness), steepness, and cumulative movements of output within cycle phases. The duration of a cycle is the number of periods elapsed between two consecutive peaks (or troughs). The amplitude or deepness of a recession is the output contraction from peak to trough in percent of GDP (and, mutatis mutandi, for an expansion). Steepness is the rate of change of output from peak to trough, or vice versa, in a given period of time. Cumulative movements of output are the output losses (gains) from peak to trough (trough to peak) relative to the previous peak (trough). As cumulative movements are approximated using a linear procedure, a measure of the excess in cumulated movements is also provided.

65. Statistics of the classical cycle for FR, DE, IT, REA, and US are set out in Table IV.1. Output contractions are defined as PT (peak-to-trough) and expansions are defined as TP (trough-to-peak). The French cycle is very similar to other countries' cycles in terms of the duration and amplitude of contractions, but diverges in terms of expansions. This divergence is a more general phenomenon: in the case of FR, IT, and REA, expansions are longer than in DE and the US (see also WEO, 2002). The French steepness statistics display significant similarity with other European countries in both phases of the cycle, although cycles throughout Europe are less steep than in the US. Finally, as shown by the excess statistic for expansions (TP), French recoveries do not display strong output expansions, a well known feature of US cycles.[37]

Table IV.1. France: Business Cycle Characteristics
(In percent, unless otherwise indicated)

	FR	DE	IT	REA	US
Mean duration (quarters)					
PT	2.7	4.0	2.7	3.0	3.0
TP	23.0	17.3	28.0	46.0	17.5
Mean amplitude					
PT	-0.7	-1.6	-1.2	-1.1	-2.2
TP	13.1	11.6	19.2	30.3	21.0
Steepness					
PT	-0.3	-0.4	-0.4	-0.4	-0.7
TP	0.6	0.7	0.7	0.7	1.2
Cumulation[1]					
PT	-1.5	-3.9	-1.4	-2.1	-4.4
TP	203.5	154.0	319.2	563.1	375.6
Excess					
PT	-0.1	-0.1	0.1	-0.1	-0.3
TP	-0.8	-0.5	1.3	-2.9	2.8

[1] Percent of GDP in first quarter of phase.

66. The divergent cyclical characteristics of European countries raise a range of important policy questions. For instance, do the divergences in output behavior across

[37] See Nadal-De Simone (2001), and references therein.

European countries change when a *growth cycle* definition is used?[38] How serious a handicap for the conduct of a single monetary policy within the Euro area is the result that other countries' expansions are longer than German ones? Could disparities across European countries in the extent to which automatic stabilizers are allowed to play explain divergences in their cycles? And what are the relative contributions to output behavior of global, regional, and idiosyncratic shocks? A thorough answer to all these questions is clearly beyond the scope of this chapter. However, Sections D and E will deal with the last one.

C. Concordance and Synchronization

67. Because turning points signal phases of contractions and expansions, any two real GDP series would be perfectly synchronized if they were in the same phase of the cycle at all points in time. Harding and Pagan (2001a) measure the fraction of time that the two series spend in the same phase using the following bivariate index of concordance:

$$I_j = \frac{1}{T}\sum_{t=1}^{T}\left\{S_{it}S_{jt} + (1-S_{it})(1-S_{jt})\right\}, \qquad (1)$$

where i and j are any two time series, T is the number of observations, and S_t is a state variable that takes the value 1 during expansions and 0 during contractions. To be a useful measure of synchronization, the index has to be modified to eliminate the possibility of obtaining high values of the index simply because one of the series spends a large fraction of the time in expansions. Thus, a mean correction of the index is necessary.[39]

68. The non-demeaned concordance index among real GDP series as well as the correlation coefficients with their t-statistics (between parentheses) are in Table IV.2.[40] There is a significant degree of synchronization between French and German and US real GDP, but

[38] The same approach used for analyzing the classical cycle was applied to the growth cycle, calculated by removing a deterministic linear time trend from the real GDP series. In general, growth cycles are more similar across countries than suggested by classical cycles, and are less divergent across European countries than between them and the US. The duration and amplitude of FR growth cycles, however, are more similar to those of REA and the US than those of DE and IT.

[39] After mean-correcting, Harding and Pagan (2001a) show that the index is proportional to the regression coefficient estimate of a linear regression of S_{jt} against a constant and S^a_t. This estimate is in turn proportional to the correlation coefficient between S_{jt} and S_{it}. This is so because the demeaned index has an expectation of zero under the null hypothesis of no synchronization.

[40] The null hypothesis is no association between the series. The t-ratios are robust to the heteroskedasticity and the serial correlation present in the state variable S_t.

not between French and Italian real GDP. There is also high synchronization for the pairs DE-IT and DE-US.

Table IV.2. France: Concordance, Correlation and t-Statistics				
		Concordance		
	FR	DE	IT	US
FR	1	0.85	0.89	0.92
DE		1	0.87	0.86
IT			1	0.88
US				1
		Correlation and t-Statistics		
	FR	DE	IT	US
FR	1	0.35*	0.19	0.43*
		(2.28)	(1.23)	(2.42)
DE		1	0.44*	0.40*
			(2.77)	(3.40)
IT			1	0.17
				(1.15)
US				1

69. The results suggest that at least part of those significant comovements might result from complicated links that the bivariate approach of the concordance index and correlation analysis would have difficulty in unveiling. Why while all European countries in the sample comove with the US, the pair FR-IT does not seem to comove in a statistically significant way? This question cannot be answered satisfactorily in a bivariate framework such as this one. A multivariate approach is necessary. The next section uses the evidence of comovement in real GDP obtained above to explore the question of the presence of a possible underlying component or factor in a multivariate framework.

D. A Model of a Common Component

70. One possible explanation for the synchronization results obtained above is that the set of time series is driven by a common factor. Therefore, it seems intuitive that the common factor be constructed by weighting the time series in some way, very much as the NBER does with its "coincident indicator index." The model that will be used for extracting this presumed common component is inspired by Stock and Watson's (1991) dynamic factor model of coincident economic indicators, which they showed to replicate the NBER coincident index fairly well. The objective of this section is to construct an index that captures the comovement of real GDP across countries. The model developed will allow for lags in the time series to capture the possibility of phase shifts in the series comovement. As shown by Harding and Pagan (2001a and 2001b), the presence of a common factor does not imply synchronization of the specific cycles.

71. The dynamic factor model can be written in levels if the series are nonstationary and cointegrated. Alternatively, the model can be written in first differences if the series are not

cointegrated. In fact, the real GDP series are clearly nonstationary (Table IV. 3) and are not cointegrated (results not shown).[41]

Table IV.3. France: Elliot, Rothenberg, and Stock Test for Unit Roots Statistics for ρ= 0 1975Q1 -2001Q4

	Lags	ΔFGLS$^{\tau}$	Lags		ΔFGLS$^{\tau}$
FR	3	-2.41	ΔFR	1	-4.20*
DE	1	-1.42	ΔDE	1	-5.94*
IT	1	-1.18	ΔIT	1	-4.81*
REA	3	-2.24	ΔREA	1	-3.36*
US	1	-2.13	ΔUS	1	-6.08*

*All variables are measured in natural logarithms. Lags are determined according to Schwarz information criterion and checking that the residuals are white noise. The ΔDFGLS$^{\tau}$ has a null of unit root with a constant and a linear trend. The 5 percent critical value is -2.89.

72. Therefore, the dynamic factor model is written in first differences as follows:

$$\Delta y_{it} = I_{it} + \gamma_i \Delta c_t + e_{it}, \tag{2}$$

where Δy_{it} represents changes in the set of real GDP time series. Δc_{it} is the change in the common component, defined as:

$$\phi(L)\Delta c = \delta + \eta_t, \tag{3}$$

where $\phi(L)$ is a lag polynomial of order p, δ is mean growth rate of the common component $c_{i|t}$, and η_t is assumed to be normally distributed with a zero mean and a variance σ_η^2. The common component is thus a random walk with a drift. The error terms e_{it} are assumed to be independent, and to follow a process defined by the lag polynomial of order k, $\psi(L)$:

$$\psi_i(L)e_{it} = \varepsilon_{it}, \tag{4}$$

where ε_{it} is normally distributed with mean zero and variance $\sigma_{\varepsilon i}^2$. The independence assumption of e_{it} means that the comovements of the real GDP series in the sample have a single source c_t, although the common component is allowed to enter each real GDP series

[41] The rates of change in GDP are all stationary.

with a different weight γ_i. For each real GDP series, $I_{it} + e_{it}$ represents the idiosyncratic component.

73. The identification issues of a coincident economic indicator model were discussed by Stock and Watson (1991), and therefore are just briefly mentioned here. First, the scale of Δc_t is identified by setting $\sigma_\eta^2 = 1$. Second, given the mean of Δy_t, I_{it} and δ are not separately identified because it is not possible to identify the factor loadings and the variance. Thus, Stock and Watson suggested writing the model in terms of deviations from sample means. This approach is also followed here. With these restrictions, the model can be put in state space form and its parameters can be estimated using full information maximum likelihood. Once the parameters are estimated, the Kalman filter is applied to obtain $\Delta c_{t|t}$.[42]

74. Finally, note that the absence of a common trend among the real GDP series (the absence of cointegration) implies that innovations to the common component c_t are transitory.

75. The common component of FR, DE, IT, REA, and US real GDP will proxy a "world" or global common factor in output. To identify the French idiosyncratic component, however, the model will be used to extract a European or regional common component that might be left in output once the global common component has been removed. For this purpose, a two-step strategy will be followed. First, the global common component among all series will be extracted. This will produce the (first-step) "idiosyncratic" component of real GDP, i.e., $I_{it} + e_{it}$. Second, using those "idiosyncratic" component series, the model will be run again to extract the European common component among FR, DE, IT, and REA, i.e., excluding US. After this second step, the original real GDP series will contain only the "true" idiosyncratic component.

E. Empirical Results

76. The results suggest that the French cycle is driven by a global common component, to a much lesser extent by a euro area common component, and has a small though significant idiosyncratic component.

The global common component

77. The estimated unobserved common global component shows significant first order serial correlation and limited second order serial correlation (Table IV.4).[43] The weight of the global common component in FR real GDP is strongly significant, and quite similar to that of

[42] A technical discussion of the modeling and estimation issues is in Kim and Nelson (1999).

[43] The common component is of order two, i.e., p=2 in $\phi(L)$, and the lag polynomial ψ_i has k=1.

other European countries. The weight of the global component in the US real GDP is only marginally significant. The (first-step) idiosyncratic components of FR and other European countries do not show significant serial correlation while the US does. The variances of all the (first-step) idiosyncratic components are, however, strongly significant. Figure IV.2 brings together the annual percentage changes in French real GDP, the global common component, and the (first-step) French idiosyncratic component.

Table IV.4. France: Estimated Single-Index Model of Common **Global** Component in Real GDP

	Variable (*i*)				
Parameters	ΔFR	ΔDE	ΔIT	ΔREA	ΔUS
γ_i	0.26*	0.31*	0.28*	0.26*	0.15
	(0.08)	(0.08)	(0.06)	(0.06)	(0.10)
	0.02				
	(0.06)				
ψ_i	-0.14	-0.02	0.05	0.01	0.23*
	(0.17)	(0.11)	(0.11)	(0.14)	(0.09)
σ_i	0.10*	0.38*	0.33*	0.13*	0.96*
	(0.03)	(0.06)	(0.05)	(0.03)	(0.13)

$$\Delta C^{g}_{t} = 0.66^{*}\ \Delta C^{g}_{t-1} + 0.03\ \Delta C^{g}_{t-2} + w_t$$
(0.30) (0.27)

L = 15.48

78. While US real GDP is less affected by a global common factor, it is likely that the significant idiosyncratic shocks to the United States output will themselves be a source of disturbance to the rest of the world. The opposite is less likely. This is an important result for understanding the international transmission of disturbances.

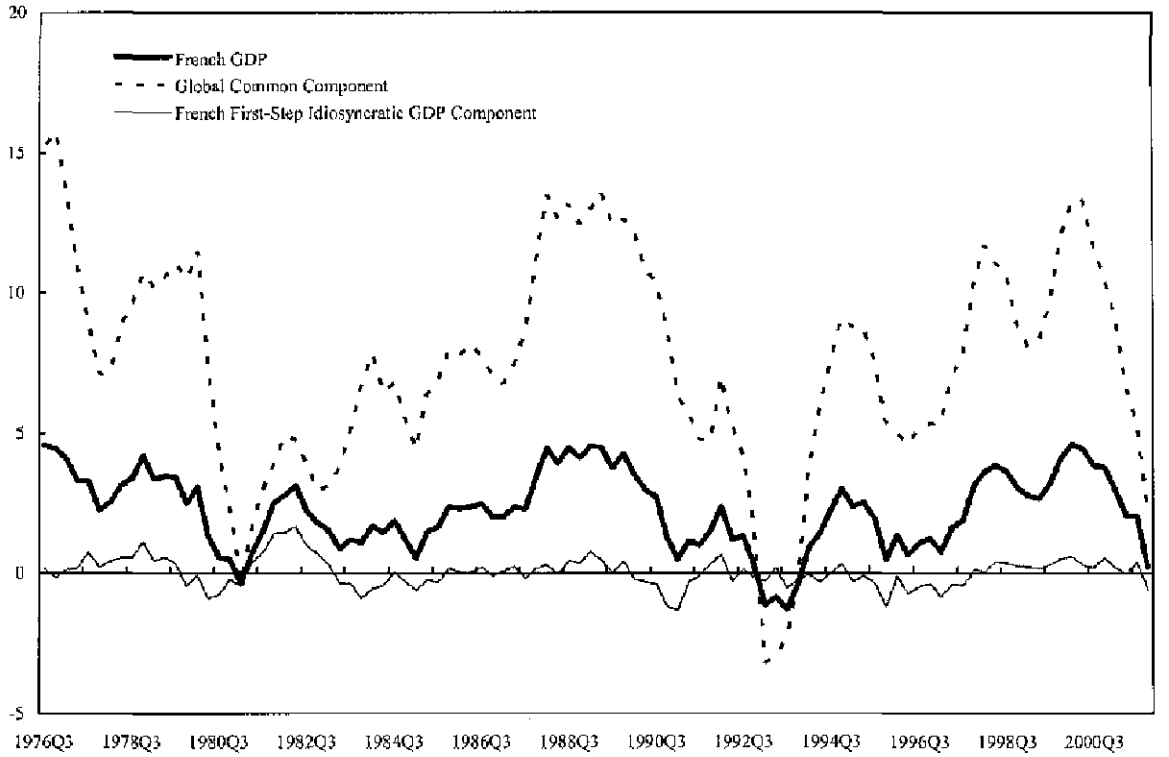
79. The estimated model seems to be well specified. With very few exceptions, the disturbances in the observed variables are not predictable (Table IV.5).[44]

The regional common component

80. The (first step) "idiosyncratic" components of FR, DE, IT, and REA (i.e., excluding US) are used to extract a euro area common component. As with the global common component, the unobserved regional common component shows significant first order serial

[44] This test regresses each of the forecast error terms of the model against a constant, 4 lags of the errors, and the changes in all real GDP series. The test was used to choose the 0-lag specification for all GDP series except the French one where one lag was preferred. The index is thus not a purely coincident index but a mixed coincident/lagging index.

Figure IV.2. French Real GDP: Global and First-Step Idiosyncratic Component
(Annual Percentage Changes)



Source: Staff estimates.

Table IV.5. France: Marginal Significance Levels of Diagnostic Test for Single-Index Model of Common Global Component					
	Forecast errors				
Regressors	e_{FR}	e_{DE}	e_{IT}	e_{REA}	e_{US}
e_{FR}	0.85	0.63	0.26	0.88	0.02
e_{DE}	0.57	0.48	0.75	0.49	0.72
e_{IT}	0.04	0.87	0.25	0.35	0.17
e_{REA}	0.32	0.75	0.31	0.79	0.55
e_{US}	0.32	0.12	0.28	0.86	0.73
ΔlnFR	0.70	0.77	0.27	0.62	0.04
ΔlnDE	0.56	0.49	0.73	0.46	0.74
ΔlnIT	0.03	0.81	0.28	0.33	0.18
ΔlnREA	0.39	0.72	0.24	0.86	0.56
ΔlnUS	0.32	0.08	0.18	0.85	0.70
The series e_i are the one-step ahead forecast errors from the single-index model. The table reports the p-values from the regression of e_i against a constant and four lags of the regressors. The p-values correspond to the F-test of the hypothesis that the coefficients on those four lags are zero. The test statistics are corrected only for the number of regressors.					

correlation, and limited second order serial correlation (Table IV.6).[45] However, the regional common component is less persistent than the global common component, i.e., the duration of shocks is 2 quarters against 3. The weights of the European common component are relatively less significant for FR output than for IT, and REA output.[46] DE real GDP, in contrast, does not seem to be affected by the euro area common component during the sample period.

Table IV.6. France: Estimated Single-Index Model of Common **Regional** Component in Real GDP				
	Variables			
Parameters	ΔFR	ΔDE	ΔREA	ΔIT
γ_i	-0.05	0.02	0.22*	-0.14*
	(0.04)	(0.06)	(0.06)	(0.08)
	0.12*	-0.07	-0.27*	0.21*
	(0.03)	(0.07)	(0.03)	(0.06)
ψ_i	-0.30*	-0.05	0.88*	0.13
	(0.13)	(0.10)	(0.08)	(0.10)
σ_i	0.06*	0.32*	0.01	0.27*
	(0.01)	(0.05)	(0.00)	(0.04)
$\Delta C^r_t =$	$0.51^* \Delta C^r_{t-1} + 0.06\ \Delta C^r_{t-2} + w_t$			
	(0.23) (0.13)			
	L = 182.42			

[45] As in the first step of the estimation process, the common component is of order two, i.e., p=2 in ϕ (L), and the lag polynomial ψ_i has k=1.

[46] Using monthly industrial production, Lumsdaine and Prasad (1999) also find that French output has lower correlation with a European common component than with the global common component.

81. French output has a significant "true" idiosyncratic component that exhibits strong negative correlation. The REA output is the only other output that has a strong idiosyncratic component. It displays positive correlation. The variances of the idiosyncratic components of FR, DE, and IT are all strongly significant.

82. The idiosyncratic factors of real GDP from the two steps, i.e., including and excluding the regional common component, are displayed in Figure IV.3. The euro area common factor is less significant for FR, and DE (especially before unification). In contrast, the euro area common component is very important for REA output—affecting it negatively—and for IT—affecting it in a positive way.

83. It is important to stress that the French idiosyncratic component has made a positive contribution to growth in the recent cycle, much like in the REA, although smaller. This contrasts with both Germany and Italy, where idiosyncratic components have been larger but have dragged growth down. Therefore, the idiosyncratic component of output of European countries needs to be part and parcel of modeling and forecasting output behavior. This finding might explain, for instance, the difficulties experienced in forecasting the differential behavior of output in France and Germany in recent years.

84. The fit of the single-index model of the regional common factor is satisfactory (Table IV.7). With just a couple of exceptions, the disturbances in the observed variables are not predictable.[47]

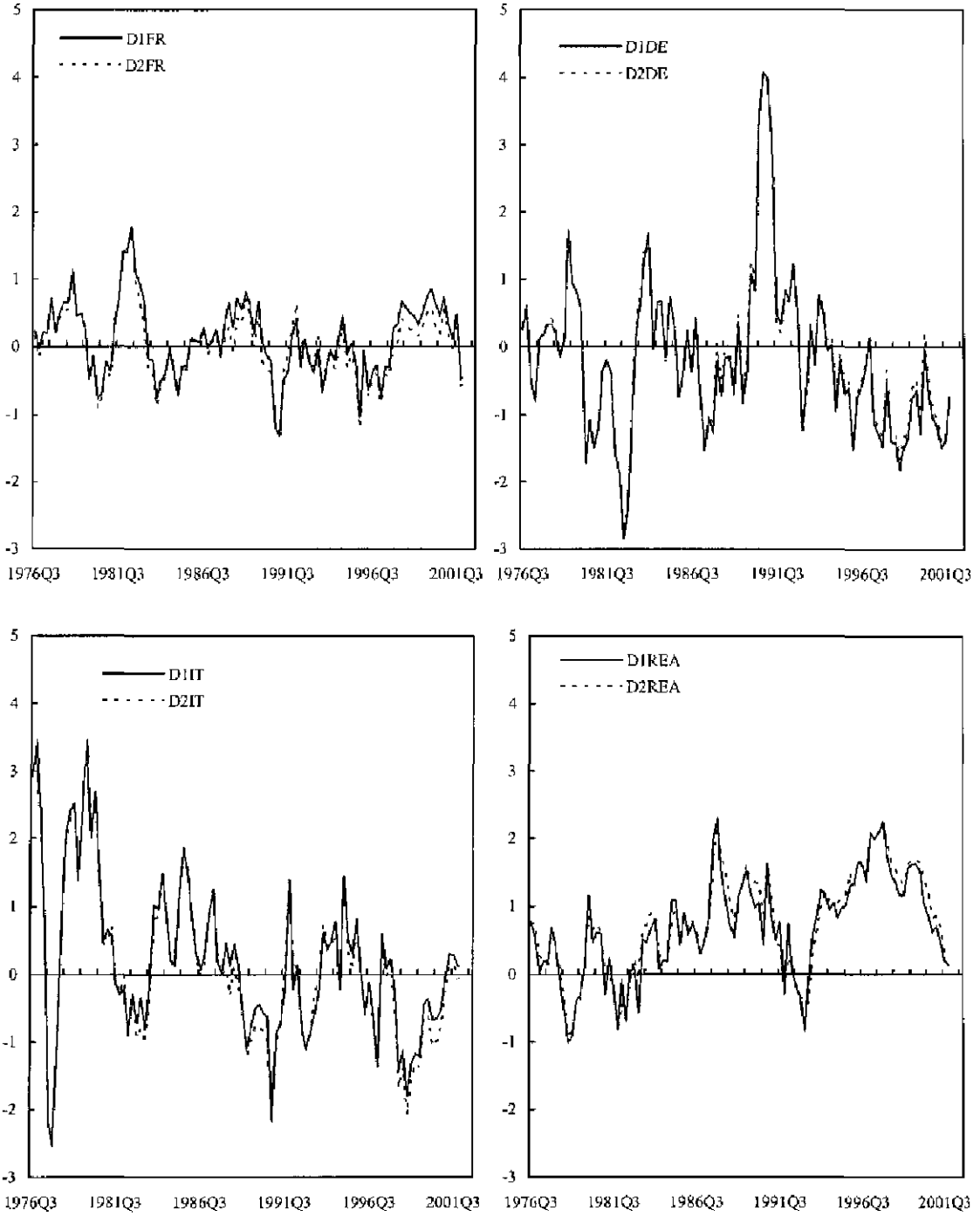
Table IV.7. France: Marginal Significance Levels of Diagnostic Test for Single-Index Model of Common **Regional** Component

	Forecast errors			
Regressors	e_{FR}	e_{DE}	e_{IT}	e_{REA}
e_{FR}	0.36	0.73	0.52	0.13
e_{DE}	0.45	0.42	0.88	0.14
e_{IT}	0.84	0.02	0.21	0.11
e_{REA}	0.29	0.17	0.82	0.09
ΔlnFR	0.39	0.90	0.88	0.13
ΔlnDE	0.43	0.42	0.87	0.14
ΔlnIT	0.86	0.02	0.22	0.11
ΔlnREA	0.25	0.16	0.06	0.48

The series e_i are the one-step ahead forecast errors from the single-index model. The table reports the p-values from the regression of e_i against a constant and four lags of the regressors. The p-values correspond to the F-test of the hypothesis that the coefficients on those four lags are zero. The test statistics are corrected only for the number of regressors.

[47] This test was used to choose the 1-lag specification for all GDP series.

Figure IV.3. Idiosyncratic Factors of Real GDP:
Including (1) and Excluding (2) the Regional Common Component
(Annual Percentage Change)



Source: Staff estimates.

F. Conclusions and Policy Implications

85. The main general finding of this chapter is that there is a great deal of comovement/synchronization between the French cycle and the rest of the world and Europe, particularly in the last cycle. The French cycle is driven by a global common component, to a much lesser extent by a euro area common component, and has a small albeit relevant idiosyncratic component. Although the latter is smaller than one would have surmised from looking at differences in employment behavior during the recent "employment-rich" expansion, the idiosyncratic component made a significant positive contribution to growth in the recent cycle.

86. The classical French cycle is very similar to other countries in terms of the duration and amplitude of contractions, but diverges somewhat in terms of expansions. This divergence is a more general phenomenon, and in the case of France shows that expansions are longer (like in Italy) than in Germany or the United States. French recoveries do not display strong early output expansions, an asymmetry that has been well documented for US cycles.

87. The similarity of contraction phases indicates a certain commonality of negative shocks to output and/or a similarity of responses to negative shocks.[48] In contrast, divergences of expansions point to cycles that tend to be supported by forces that contain more idiosyncratic elements. These results suggest a number of policy implications.

88. Policy making should take into account that while cycles across euro area countries share broadly similar characteristics, disparities remain. For example, the results suggest the desirability of coordinating fiscal policies to contribute to the smoothing of remaining disparities in cycles, and to let automatic stabilizers operate symmetrically over the cycle.[49] If, for instance, expansions tend to be relatively longer in France, given a certain Euro area monetary policy stance, it will be desirable that French fiscal policy contributes to achieving the appropriate overall policy mix for the country. Looking forward, however, it could be argued that attainment of the Stability and Growth Pact requirements will be sufficient to induce the required discipline. In that case, once France has attained a sustainable structural fiscal position determined also by the impact of aging and reforms undertaken to deal with it, the unfettered play of automatic stabilizers operating symmetrically over the cycle should be

[48] The WEO (2002) suggests that monetary policy could be such a common shock, at least in the case of synchronized recessions: peaks in interest rates usually just preceded or just followed peaks in output. Also, interest rate increases prior to the peaks are positively correlated with the depth of the subsequent recessions.

[49] The functioning of automatic stabilizers in the Euro area is discussed in Decressin et al, 2001.

enough to bring the country close to a combination of price stability and relatively low output variance.

89. Similarly, the importance of idiosyncratic components in output behavior indicates the need for flexibility in labor and product markets to respond to the transmission of output disturbances across countries. Unless the reforms geared to increasing labor and product market flexibility help to smooth divergences in cycle characteristics, output and inflation volatility may be unnecessarily high in some countries.

90. In order to shed light into the French idiosyncratic component it would be necessary to understand its determinants. If the component were the result of the labor market reforms enacted in the 1990s, (including the significant cuts on social security contributions), it would be likely that the beneficial effects of at least some of those measures continue to affect output growth positively for some time. The idiosyncratic component could also be the result of more transient factors, however. For instance, reductions in social security contributions that did not increase labor force participation would not have a lasting effect on growth. Implications for policy will be, therefore, contingent on the nature of the idiosyncratic component. Although a full analysis of the issue goes beyond the scope of this research, it could be construed that wage moderation and cuts in social security contributions (and other taxes) during the 1990s initiated a phase of labor deepening that pushed French growth up. They helped keep inflation low and increased real disposable income.[50] As a result, consumption was buoyant, which in turn had a positive impact on growth.

[50] INSEE (2001) shows that long-run consumption depends positively on real disposable income and negatively on inflation. Similarly, real disposable income has a positive effect of the short-run dynamics of consumption.

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