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TRADE INTENSITY AND OUTPUT SYNCHRONISATION:

ON THE ENDOGENEITY PROPERTIES OF EMU

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1. Introduction

The euro zone sovereign debt crisis following the recent financial turmoil has raised again the question of the sustainability of EMU and whether in its current form it can be considered an optimal currency area (OCA). In fact a number of recent studies (Chen et al., 2012; Schmitz and von Hagen, 2009; Sinn et al., 2011) concluded that during its first decade imbalances between member states and differences in business cycle patterns in the core and in the periphery increased.

As is well known, OCA theories (Mundell, 1961; McKinnon, 1963; Kenen, 1969) argue that the degree of synchronisation of national business cycles is an indicator of the cost of adopting a common currency and relinquishing monetary policy independence: the more synchronised they are, the more effective a common monetary policy is. Therefore, from a financial stability perspective, output synchronisation has crucial implications in the context of EMU, reducing the likelihood of asymmetric responses to shocks and thus increasing the effectiveness of "one fits all" ECB policies.

OCAs theories, however, do not provide formal criteria to evaluate whether the timing of the various steps necessary to create a currency area can be considered optimal, neither do they specify unique measures of the potential gains and losses. Individual OCA properties (e.g. labour and capital markets integration, price flexibility) as well as meta-properties aggregating several criteria have been considered. In the case of EMU, the positive impact of trade flows on output synchronisation predicted by Frankel and Rose (1998) has been analysed mainly in its very early stages (see the survey by Barbosa and Alves, 2011) – surprisingly, despite their availability, longer runs of data have not been used to test for long-run effects.

lower degree of business cycle co-movement depending on whether or not demand- and supply-side effects dominate over increased specialisation of production (Baxter and Kouparitsas, 2005; Imbs, 2006). In particular, the "specialisation" paradigm postulates that as countries become more integrated, their industrial structure develops according to their comparative advantages (Bayoumi and Eichengreen, 1996), and thus the economy of each member country of an OCA becomes more vulnerable to supply shocks. By contrast, according to the endogenous view of OCAs the positive link between income correlation and trade integration is magnified for countries joining a currency union, and therefore the conditions for an OCA might be satisfied ex-post even if they were not met ex-ante.

This paper, using annual bilateral data over the period 1988-2011 for a panel of 24 industrialised and emerging economies, contributes to the existing literature in three ways. First, unlike the existing studies covering a short time period after the launch of

represent severe obstacles to the well-functioning of EMU and raise questions about its future stability. The fact that more intense intra-EMU trade flows did not lead to greater convergence in economic developments across the euro area suggests that a higher degree of economic policy coordination between the euro area members is needed.

This paper is organised as follows. In Section 2 the empirical strategy is outlined. Sections 3 describe the dataset. Section 4 discusses the results of the time-varying analysis of the relationship between trade intensity and output synchronisation, as well as the evidence based on a number of alternative specifications. Section 5 offers some concluding remarks.

2. The empirical strategy

Since the study of Frankel and Rose (1998) a large body of empirical research (Clark and van Wincoop 2001; Calderon et al. 2007; among others) has shown that bilateral trade flows (ὸὶὤ) can affect output synchronisation (”) across countries and/or regions. Following this literature, a canonical regression model can be specified as

” عي • ٍپὸὶὤ شر - (1)

The positive effect of bilateral trade flows on the degree of international business cycle synchronisation has been widely confirmed in the most recent literature even when controlling for other possible determinants, such as capital flows or industry specialisation (Imbs, 2004, 2010, Baxter and Kouparitsas 2005, Böwer and Guillemineau, 2006, Inklaar et al., 2008).

However, standard international business cycle models have difficulty in matching the Frankel and Rose (1998) empirical results, leading to a “trade-comovement puzzle” (Kose and Yi 2006). According to standard theory, trade intensity

has an ambiguous effect on the co-movement of output. Openness to trade will lead to increased specialisation in production and inter-industry patterns of international trade. If business cycles are dominated by industry-specific shocks, trade-induced specialisation leads to decreasing business cycle correlations. However, if trade is dominated by intra-industry trade industry-specific shocks may lead to more symmetric business cycles. Consequently, the positive link between trade and business cycle synchronisation is often seen as an indication that intra-industry dominates inter-industry trade as a spillover channel for shocks.[1]

When testing condition (1) empirically, output synchronisation is typically measured by filtering variables measuring the level of activity (i.e. real output or industrial production indices) over a selected window, ranging from a few years (Mathy and Meissner, 2011) to several decades (Frenkel and Rose, 1998). Here instead we follow Giannone et al. (2009) and measure the degree of synchronisation as the negative of divergence in growth rates, defined as the absolute value of GDP (ώ) differences between country ῼ and ὼ in a given year ὸ:

$$\text{سر عي}\ \Delta \ln ώ_{ῼ} - \text{سر}\ \Delta \ln ώ_{ὼ} \qquad (2)$$

This index is not subject to the criticism of various filtering methods and makes it possible to assess the degree of output synchronisation on a year-by-year basis rather than as an average of multi-year windows.

Concerning trade intensity, we follow Frankel and Rose (1998) and employ total trade between two countries scaled by total GDP or total trade. Accordingly, we compute (a time-varying version of) bilateral trade intensities as

[1] For the specific case of euro area, intra-industry is found to be very relevant by Di Giovanni and Levchenko (2010).

$$tiw_{ij}^{t} = \frac{x_{ij}^{t} + m_{ij}^{t}}{y_{i}^{t} + y_{j}^{t}} \qquad (3)$$

where t is a time index, x_{ij}^{t} denotes total merchandise exports from the i-th (reporting) EMU economy to its j-th trading partner (namely the rest of EMU countries as well as other relevant economies taken as a control group), m_{ij}^{t} represents total imports of the i-th EMU country from its j-th trading partner, and y_{i}^{t} and y_{j}^{t} are the nominal GDP levels in the two economies.

While the qualitative conclusions concerning the impact of trade on income correlation are generally not dependent on the exact measure chosen (i.e. Calderon et al., 2007; Inklaar et al., 2008), the main problem in correctly estimating it is that trade intensity is endogenous. This makes simple ordinary least squares (OLS) regressions of

In order to analyse them in greater depth, we also run several regression with interaction effects

$$\text{[illegible]} \qquad (5)$$

with $\text{[illegible]} = 1, \ldots, 5$ where the [illegible]-th binary indicator takes value one (and zero otherwise) for: (a) pairs of countries both belonging to EMU ($\text{[illegible]} = 1$), in order to disentangle genuine intra-area effects from the influence of extra-EMU developments; (b) pairs of countries both in EMU but with the reporting economy being a core European country ($\text{[illegible]} = 2$) or a peripheral European country ($\text{[illegible]} = 3$) respectively, in order to investigate whether there are diverging patterns between core and peripheral countries as recently shown by Lehwald (2012); and (c) pairs of countries both in the core ($\text{[illegible]} = 4$) or in the peripheral EMU ($\text{[illegible]} = 5$) respectively, as would be implied by a two-speed Europe, with only Germany, its smaller neighbours (including

The partner economies are the same countries listed above as well as industrialised (Australia, Canada, Denmark, Japan, Korea, Norway, New Zealand, Sweden, Switzerland, the UK and the US) and emerging economies (Brazil, China, India, Russian Federation) as a control group named Rest of the World (ROW). Following the literature (von Hagen and Neumann, 1994; Caporale and Girardi, 2011) we define Austria, Belgium, Finland, France, Geeb(J)and

(Panel B and C, respectively) emerge, notably a relative increase in output synchronisation for the core countries with respect to the rest of the euro area and to the other core countries, except for the year 1991, which marks German reunification. In the peripheral countries, output synchronisation de

be detected. This finding s

fixed effects models, is clearly hard to interpret. Moreover, year-by-year estimations of the impact of trade intensity on output synchronisation are likely to be influenced by shocks hitting the system in a specific year. In order to provide an overview of the results, we analyse the time series averages of the yearly slopes, along with their standard errors corrected for serial correlation as suggested by Petersen (2009).[5]

According to the results in Table 2, in the period 1988-2011 the average relationship between trade intensity and output synchronisation for the EMU countries and the ROW is positive and highly significant, in line with the empirical literature surveyed by de Haan et al. (2007). Since the trade intensity measure is expressed in logarithms and the dependent variable in percentage points, the estimates in Table 2 can be interpreted as semi-elasticities. For instance, the coefficient of about 0.65 for the full sample implies that an increase in bilateral trade intensity of one percent (roughly the value of its sample standard deviation as reported in Table 1) leads to an average increase in output synchronisation of 0.7. Given the (absolute) median value of output synchonisation of 1.7 (see Table 1), these are significant effects in economic terms as well.

[Table 2]

4.2 Rolling averages

The aggregate picture, however, could hide some dynamic heterogeneity in the trade-output relationship. With this in mind, we analyse the behaviour of the coefficient over behaviwitve ith heJhe -27.58 Tf60 -2.28D36530 Tc.0491 5

Tables A.1-A.6. Considering the whole period (Figure 3), it can be se

afterwards. Therefore, the declining trend in the semi-elasticities for EMU country pairs of Figure 4 can be ascribed almost entirely to the peripheral EMU countries.

[Figure 5]

Similar evidence is provided by Figure 6, where the ‍ٍ and ‍ٍ coefficients for EMU core and periphery country pairs, that is model (5) with ٰ‍ 4 (dashed lines) and ٰ‍ 5 (dotted lines) respectively, are presented. These findings suggest the existence in the euro period of both output synchronisation (see, for instance, Lehwald, 2012) and more structural differences. More specifically, it seems that trade intensity has led to higher business cycle correlation only among the

panel of 24 industrialised and emerging economies. This is a crucial issue for the effectiveness of a single monetary policy and financial stability.

Our findings show that the relationships between trade intensity and output synchronisation is positive and statistically significant (with a few exceptions). Moreover, the evidence of a declining effect over time, and in the euro years in particular, supports the specialisation model of Krugman (1993) in preference to the endogeneity hypothesis of B13C

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Tables

Table 1 – Descriptive statistics

	Output synchronisation					
	N	mean	median	sd	min	max
Full sample	7106	-2.5034	-1.7110	2.5329	-18.3963	-0.0005
EMU pairs	2630	-1.8431	-1.3004	1.8321	-11.1695	-0.0006
Core *vis-à-vis* EMU	1435	-1.6189	-1.1469	1.7021	-11.1695	-0.0006
Periphery *vis-à-vis* EMU	1195	-2.1125	-1.5584	1.9438	-10.4630	-0.0037
Core EMU pairs	715	-1.2960	-0.9749	1.4037	-11.1695	-0.0006
Periphery EMU pairs	480	-2.3694	-1.8624	1.9736	-8.5126	-0.0179
	Trade intensity					
	N	mean	median	sd	min	max
Full sample	7074	0.0061	0.0023	0.0105	0.0000	0.1345
EMU pairs	2630	0.0105	0.0048	0.0149	0.0002	0.1345
Core *vis-à-vis* EMU	1435	0.0142	0.0063	0.0184	0.0008	0.1345
Periphery *vis-à-vis* EMU	1195	0.0060	0.0032	0.0067	0.0002	0.0368
Core EMU pairs	715	0.0212	0.0098	0.0229	0.0016	0.1345
Periphery EMU pairs	480	0.0043	0.0023	0.0051	0.0002	0.0254

Table 2 – Temporal aggregation of year-by-year estimates

EMU vs all	
1	
EMU pairs vs extra-EMU partners	
1	
2	
3	
Core EMU countries vs EMU and extra-EMU partners	
1	
2	
3	
Peripheral EMU countries vs EMU and extra-EMU partners	
1	
2	
3	
Core EMU country pairs vs other EMU and non-EMU partners	
1	
2	
3	
Peripheral EMU country pairs vs other EMU and non-EMU partners	
1	
2	
3	

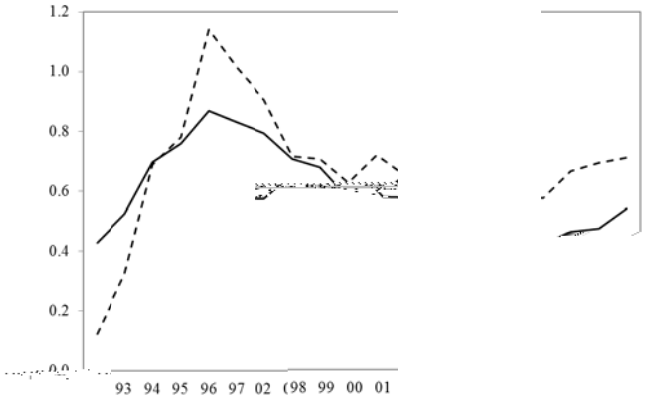
Time series averages of the yearly slopes reported in Tables A1-A6 of the Appendix. Coefficients in bold and italics indicate statistical significance at the 5 and 10 percent nominal level (or better), respectively. Standard errors corrected by serial correlation according to Petersen (2009) in parentheses.

Figure 1 –

Panel A. Solid and dashed lines
EMU country pairs, respectivel
output synchronisation different
EMU country pai
(peripheral) EMU

Panel

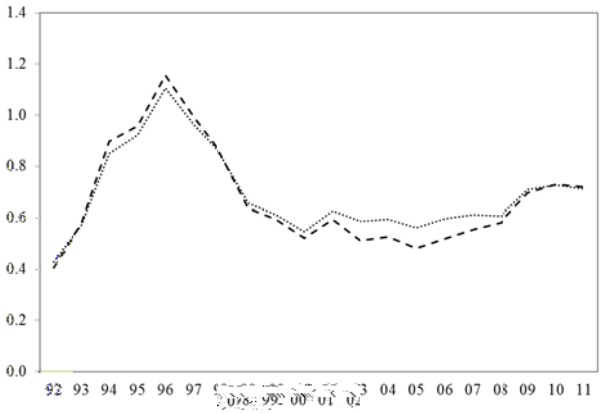
Figure 4 – Rolling estimates: EMU pairs vs non-EMU partners



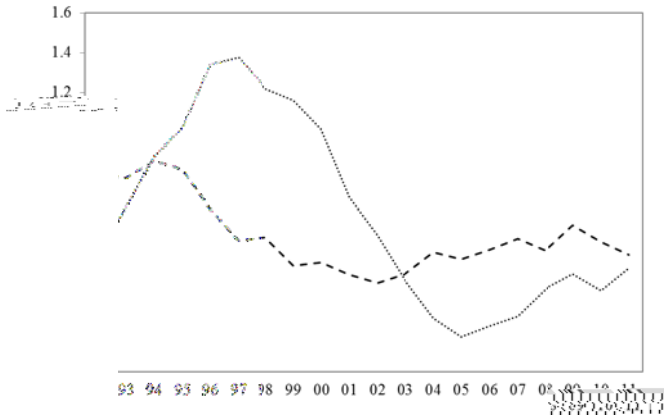
Rolling moving averages (5 years) of the estimated parameter of condition (5) in the main text for . Panel A. reports the coefficients (solid line) and (dashed line).

Figure 6 – Rolling estimates: core and peripheral EMU pairs vs other EMU and non-EMU partners

Panel A.



Panel B.



Rolling moving averages (5 years) of the estimated parameter of condition (5) in the main text for (dashed line) and (dotted line). Panel A and B report the 's, 's, respectively.

Appendix

Table A.1 – EMU countries vs all partners

		1	N	jp	
1988	**0.8346**	(0.0919)	275	[0.130]	
1989	*0.1032*	(0.0516)	275	[0.095]	
1990	**0.6019**	(0.0577)	286	[0.173]	
1991	-0.1319	(0.1195)	286	[0.107]	
1992	**0.9101**	(0.1089)	289	[0.220]	
1993	**1.5205**	(0.1794)	296	[0.104]	
1994	**1.4579**	(0.1307)	296	[0.092]	
1995	**0.9165**	(0.1137)	297	[0.095]	
1996	**0.6606**	(0.1387)	297	[0.092]	
1997	0.1497	(0.1163)	297	[0.095]	
1998	**0.9185**	(0.0733)	297	[0.096]	
1999	**0.4798**	(0.1097)	297	[0.094]	
2000	**0.6695**	(0.1407)	297	[0.097]	
2001	**0.3513**	(0.0854)	297	[0.097]	
2002	**0.5139**	(0.1494)	297	[0.169]	
2003	**0.6495**	(0.1759)	297	[0.119]	
2004	**0.5285**	(0.0970)	297	[0.097]	
2005	**0.5209**	(0.1033)	297	[0.096]	
2006	**0.5207**	(0.0745)	297	[0.093]	
2007	**0.6409**	(0.0661)	297	[0.090]	
2008	**0.7073**	(0.0702)	297	[0.092]	
2009	**1.0700**	(0.0704)	297	[0.133]	
2010	**0.6340**	(0.0929)	297	[0.100]	
2011	**0.4778**	(0.0798)	297	[0.098]	2011

Table A.2 – EMU pairs vs non-EMU partners

	1		2		3		N	jp
1988	*0.2251*	(0.1114)	**0.6291**	(0.1467)	-0.8564	(0.7443)	275	[0.147]
1989	0.0914	(0.0995)	**-0.3155**	(0.0702)	**3.5673**	(0.4188)	275	[0.147]
1990	**0.6225**	(0.1421)	**0.4717**	(0.1511)	1.1665	(0.9586)	286	[0.271]
1991	0.3199	(0.1853)	**-0.9924**	(0.3104)	**9.5454**	(1.5071)	286	[0.146]
1992								

Table A.3 – Core EMU countries vs EMU and non-EMU partners

	1		2		3		N	jp
1988	*0.2775*	(0.1321)	**0.7450**	(0.1234)	*-1.2198*	(0.6422)	275	[0.170]
1989	*0.2197*	(0.1058)	-0.1080	(0.0776)	**2.7121**	(0.5676)	275	[0.140]
1990	**0.5746**	(0.2259)	**0.5645**	(0.1037)	0.2446	(1.0105)	286	[0.249]
1991	**0.4939**	(0.1505)	*-0.5019*	(0.2644)	**6.6094**	(1.2628)	286	[0.144]
1992	**0.7163**	(0.0551)	**0.8849**	(0.1361)	-0.4093	(0.6775)	289	[0.321]
1993	**0.3301**	(0.0890)	**1.6394**	(0.2060)	**-6.3072**	(1.1519)	296	[0.156]
1994	**0.6352**	(0.1641)	**1.4975**	(0.1685)	**-3.7533**	(1.3506)	296	[0.141]
1995	**0.7368**	(0.1536)	**0.9008**	(0.1488)	-0.4328	(1.2097)	297	[0.154]
1996	**0.6328**	(0.2641)	**0.6994**	(0.1678)	-0.4364	(1.5792)	297	[0.141]
1997	**0.6042**	(0.2554)	0.1485	(0.1326)	1.9735	(1.1593)	297	[0.151]
1998	*0.3560*	(0.1936)	**0.9995**	(0.1209)	**-3.2169**	(0.9196)	297	[0.157]
1999	*0.2720*	(0.1323)	**0.5087**	(0.1588)	-1.1070	(0.8835)	297	[0.161]
2000	**0.6699**	(0.1201)	**0.7455**	(0.2043)	-0.6634	(1.2757)	297	[0.144]
2001	**0.5159**	(0.0978)	**0.3421**	(0.1153)	0.8815	(0.7937)	297	[0.150]
2002	**0.6589**	(0.1644)	**0.5097**	(0.1895)	0.8442	(1.3030)	297	[0.187]
2003	**1.0791**	(0.0997)	**0.5896**	(0.2156)	*2.5400*	(1.2836)	297	[0.191]
2004	**0.3902**	(0.1341)	**0.5424**	(0.1141)	-0.6130	(0.8992)	297	[0.151]
2005	**0.5182**	(0.1029)	**0.4510**	(0.1190)	0.8928	(0.8355)	297	[0.159]
2006	**0.5477**	(0.0438)	**0.4843**	(0.0913)	0.5930	(0.4464)	297	[0.146]
2007	**0.3519**	(0.0704)	**0.6504**	(0.0862)	*-1.0881*	(0.5327)	297	[0.140]
2008	**0.3364**	(0.0983)	**0.7173**	(0.0852)	*-1.4087*	(0.7329)	297	[0.149]
2009	**0.4028**	(0.0589)	**1.1029**	(0.102)	**-2.8885**	(0.4226)	297	[0.167]
2010	**0.8986**	(0.0728)	**0.6539**	(0.0900)	0.8932	(0.5444)	297	[0.156]
2011	**1.1856**	(0.0669)	**0.5652**	(0.0835)	**1.7494**	(0.3797)	297	[0.198]

Fixed effects IV estimation results of model (5) with ٢ عي and distance (and its squared term), common border, common languages, the (log of) the size of the partner country and membership to WTO as external instruments. Coefficients in bold and italics indicate statistical significance at the 5 and 10 percent nominal level (or better), respectively. Robust standard errors obtained via clustering of the residual along the reporting country dimension in parentheses. p-value associated to the Hansen-J statistics for the null of no correlation between instruments and the disturbance process (jp) in square brackets.

Table A.4 – Peripheral EMU countries vs EMU and non-EMU partners

	1		2		3		N	jp
1988	0.1136	(0.2062)	**0.7650**	(0.1115)	*-2.6076*	(1.2737)	275	[0.105]
1989	0.0958	(0.1998)	-0.0023	(0.0883)	1.5894	(1.0490)	275	[0.091]
1990	**0.8447**	(0.1563)	**0.5471**	(0.0806)	2.0389	(1.296)	286	[0.156]
1991	**0.8750**	(0.2327)	*-0.3875*	(0.1873)	**9.3323**	(1.9039)	286	[0.107]
1992	**1.1457**	(0.0669)	**0.8974**	(0.1194)	1.5096	(0.9222)	289	[0.204]
1993	**1.0426**	(0.2465)	**1.5137**	(0.1842)	-2.4936	(1.7038)	296	[0.106]
1994	**1.1201**	(0.2736)	**1.4864**	(0.1271)	-2.1471	(1.7653)	296	[0.090]
1995	**1.0676**	(0.3610)	**0.9690**	(0.0953)	0.1362	(2.0635)	297	[0.107]
1996	**1.0337**	(0.4490)	**0.7565**	(0.1313)	0.7176	(2.5607)	297	[0.091]
1997	**1.0014**	(0.3913)	0.1786	(0.1301)	**4.2285**	(1.8550)	297	[0.108]
1998	0.4510	(0.3688)	**0.9796**	(0.0976)	*-3.2131*	(1.6477)	297	[0.104]
1999	**0.7769**	(0.2369)	**0.5242**	(0.1305)	1.0264	(0.9609)	297	[0.151]
2000	*0.6784*	(0.3678)	**0.7903**	(0.1368)	-1.5251	(1.8731)	297	[0.094]
2001	-0.1495	(0.2273)	**0.4190**	(0.0736)	**-3.6180**	(1.2032)	297	[0.115]
2002	0.3144	(0.3308)	**0.6382**	(0.1303)	-2.7378	(1.9062)	297	[0.560]
2003	0.1078	(0.4052)	**0.8165**	(0.1342)	*-5.0900*	(2.4169)	297	[0.155]
2004	0.2712	(0.2230)	**0.5826**	(0.0917)	-2.0346	(1.3887)	297	[0.099]
2005	0.3247	(0.3737)	**0.5616**	(0.0852)	-1.4465	(2.3182)	297	[0.101]
2006	0.1302	(0.2503)	**0.5681**	(0.0752)	*-2.5437*	(1.3495)	297	[0.095]
2007	**0.4425**	(0.1586)	**0.6459**	(0.0749)	-1.0118	(0.8177)	297	[0.090]
2008	0.1044	(0.1777)	**0.6835**	(0.0736)	**-2.5963**	(0.9627)	297	[0.093]
2009	**0.7782**	(0.3262)	**1.0496**	(0.0863)	-1.3558	(1.3132)	297	[0.141]
2010	0.2201	(0.1575)	**0.5800**	(0.1051)	-1.2447	(0.9829)	297	[0.106]
2011	0.4733	(0.3156)	**0.4764**	(0.0941)	0.1079	(1.8106)	297	[0.117]

Fixed effects IV estimation results of model (5) with ٰٖ 3 and distance (and its squared term), common border, common languages, the (log of) the size of the partner country and membership to WTO as external instruments. Coefficients in bold and italics indicate statistical significance at the 5 and 10 percent nominal level (or better), respectively. Robust standard errors obtained via clustering of the residual along the reporting country dimension in parentheses. p-value associated to the Hansen-J

Table A.5 – Core EMU country pairs vs other EMU and non-EMU partners

	1		2		3		N	jp
1988	**0.3049**	(0.1123)	**0.8323**	(0.1212)	**-1.9521**	(0.7656)	275	[0.189]
1989	*0.0954*	(0.0502)	-0.0440	(0.0659)	**1.6830**	(0.3887)	275	[0.140]
1990	**0.7484**	(0.1786)	**0.6069**	(0.0905)	0.4351	(1.0560)	286	[0.249]
1991	**1.4512**	(0.2613)	-0.3046	(0.1983)	**8.1986**	(1.9550)	286	[0.151]
1992	**1.3304**	(0.1424)	**0.9449**	(0.1299)	1.2773	(0.8639)	289	[0.335]
1993	0.2297	(0.1652)	**1.6880**	(0.2057)	**-7.2381**	(1.1232)	296	[0.154]
1994	**0.5313**	(0.2083)	**1.5526**	(0.1596)	**-4.7567**	(1.2711)	296	[0.140]
1995	**0.5267**	(0.2042)	**0.9140**	(0.1353)	-1.3203	(1.1186)	297	[0.159]
1996	0.4507	(0.2979)	**0.6816**	(0.1549)	-0.9431	(1.5157)	297	[0.142]
1997	**0.5490**	(0.1511)	0.1225	(0.1246)	**2.0450**	(0.7878)	297	[0.155]
1998	0.3182	(0.2500)	**0.9823**	(0.1016)	**-3.1672**	(1.2110)	297	[0.156]
1999	-0.1834	(0.1018)	**0.4803**	(0.1408)	**-2.4942**	(0.7400)	297	[0.156]
2000	**0.6018**	(0.1622)	**0.7032**	(0.1781)	-0.5002	(1.2179)	297	[0.147]
2001	0.1494	(0.0935)	**0.3158**	(0.0984)	-0.2423	(0.6555)	297	[0.165]
2002	0.3384	(0.2000)	**0.4906**	(0.1695)	-0.1603	(1.1512)	297	[0.358]
2003	**0.5432**	(0.2251)	**0.5659**	(0.1942)	0.8465	(1.2596)	297	[0.185]
2004	0.3721	(0.2572)	**0.5618**	(0.1108)	-0.9439	(1.1637)	297	[0.151]
2005	**0.4135**	(0.1695)	**0.4753**	(0.1130)	0.3146	(0.8471)	297	[0.151]
2006	**0.4038**	(0.0809)	**0.4970**	(0.0884)	-0.0394	(0.5452)	297	[0.143]
2007	**0.6043**	(0.0980)	**0.6701**	(0.0846)	-0.4593	(0.5973)	297	[0.141]
2008	**0.2424**	(0.0911)	**0.7019**	(0.0913)	*-1.4930*	(0.7107)	297	[0.150]
2009	**1.0193**	(0.0711)	**1.1445**	(0.1019)	**-1.1818**	(0.4677)	297	[0.180]
2010	-0.0120	(0.1389)	**0.6307**	(0.1089)	**-2.2111**	(0.6796)	297	[0.160]
2011	0.0822	(0.0789)	**0.4526**	(0.1114)	*-0.9951*	(0.5227)	297	[0.192]

Fixed effects IV estimation results of model (5) with ٱ عي 4 and distance (and its squared term), common

Table A.6 – Peripheral EMU country pairs vs other EMU and non-EMU partners

	1		2		3		N	jp
1988	0.2933	(0.2633)	**0.8066**	(0.0969)	-2.0424	(1.6380)	275	[0.138]
1989	0.1025	(0.2275)	0.0796	(0.0585)	0.5406	(1.2288)	275	[0.091]
1990	**0.8116**	(0.2254)	**0.5844**	(0.0598)	1.5792	(0.9045)	286	[0.184]
1991	-0.1926	(0.1248)	-0.2115	(0.1292)	**2.2180**	(0.9399)	286	[0.146]
1992	**0.9535**	(0.2318)	**0.8886**	(0.1094)	1.3360	(1.7636)	289	[0.225]
1993	**1.4645**	(0.4872)	**1.5169**	(0.1779)	0.2418	(3.3218)	296	[0.106]
1994	**1.3410**	(0.4727)	**1.4720**	(0.1286)	-0.5668	(3.1177)	296	[0.092]
1995	**1.5538**	(0.5163)	**0.9449**	(0.1162)	2.9651	(2.8645)	297	[0.106]
1996	**1.3934**	(0.4732)	**0.7018**	(0.1411)	3.0462	(2.5151)	297	[0.092]
1997	**1.1264**	(0.3736)	0.1734	(0.1246)	**4.8048**	(1.5877)	297	[0.111]
1998	**0.6822**	(0.3197)	**0.9432**	(0.0858)	-1.8105	(1.2353)	297	[0.102]
1999	**1.0504**	(0.3338)	**0.5178**	(0.1225)	2.1818	(1.2361)	297	[0.123]
2000	**0.8296**	(0.3297)	**0.7224**	(0.1485)	-0.1651	(1.7289)	297	[0.102]
2001	-0.3261	(0.2459)	**0.3766**	(0.0933)	**-4.2124**	(1.2504)	297	[0.120]
2002	0.1803	(0.2523)	**0.5763**	(0.1538)	**-3.1697**	(1.0426)	297	[0.667]
2003	-0.4487	(0.3702)	**0.7379**	(0.1723)	**-8.0547**	(1.8545)	297	[0.118]
2004	0.1105	(0.1964)	**0.5590**	(0.0973)	**-2.8363**	(1.0769)	297	[0.096]
2005	0.3593	(0.3560)	**0.5554**	(0.1006)	-1.5593	(2.1000)	297	[0.098]
2006	-0.0576	(0.2641)	**0.5581**	(0.0749)	**-3.8833**	(1.3220)	297	[0.096]
2007	**0.4196**	(0.1798)	**0.6537**	(0.0686)	-1.2855	(1.1903)	297	[0.090]
2008	0.2511	(0.2470)	**0.7038**	(0.0665)	-2.0029	(1.2893)	297	[0.094]
2009	**0.4756**	(0.1058)	**1.0805**	(0.0755)	**-3.2259**	(0.5244)	297	[0.151]
2010	-0.0593	(0.4296)	**0.6424**	(0.0986)	-3.5751	(2.6635)	297	[0.108]
2011	0.5069	(0.5688)	**0.4746**	(0.0848)	0.4335	(3.2347)	297	[0.121]

Fixed effects IV estimation results of model (5) with ٱ عي 5 and distance (and its squared term), common border, common languages, the (log of) the size of the partner country and membership to WTO as external instruments. Coefficients in bold and italics indicate statistical significance at the 5 and 10 percent nominal level (or better), respectively. Robust standard errors obtained via clustering of the residual along the reporting country dimension in parentheses. p-value associated to the Hansen-J statistics for the null of no correlation between instruments and the disturbance process (jp) in square brackets.