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Monetary and Financial Integration:

Evidence from Portuguese Borrowing Patterns

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ABSTRACT

This paper examines the impact of European Monetary Union (EMU) accession on bilateral Portuguese international borrowing patterns. Using a difference-in-differences methodology, I demonstrate that Portugal's accession to the EMU was accompanied by a change in its borrowing pattern in favor of borrowing from its EMU partner nations. This extends the evidence in the literature that overall international borrowing is facilitated by the creation of a monetary union, and raises the issue of financial diversion. The results are shown to survive a wide variety of robustness checks and are corroborated by preliminary evidence concerning Greece's accession to EMU in 2001.

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1. Introduction

It is widely believed that monetary integration can lead to both enhanced trade and financial integration. Rose (2000) demonstrates a robust relationship between monetary integration and bilateral trade volumes. Considering financial integration, Blanchard and Giavazzi (2002) show that increases in the 1990s of the correlations between current account positions and per capita incomes of future European Monetary Union (EMU) countries exceeded those of non-EMU European Community (EC) countries, and further exceeded those of non-EC OECD countries, suggesting that monetary integration enhanced financial integration. Adam, et al (2002) obtain mixed evidence concerning the growth of financial integration among EMU nations. Consistent with an increase in financial integration, they find a decrease in the correlation between national savings and investment in the EC subsequent to 1995. However, they also fail to find evidence of increased foreign bank shares in total national assets subsequent to EMU entry, suggesting the absence of any home bias decline in lending patterns.

There are a number of reasons why monetary integration might enhance financial integration: First, monetary integration reduces currency risk in international lending between partner countries. Second, membership in a monetary union increases the penalty for default on lending [e.g. Gourinchas and Jeanne (2004)].

Monetary integration in the EMU occurred in an environment where goods and financial market liberalization was also taking place. Blanchard and Giavazzi (2002) note that since the early 1990s the European Union has harmonized its safety requirements and enhanced its distribution networks. This has led goods produced in the EC to become closer substitutes, implying that borrowing EC nations would face smaller

declines in their terms of trade if they needed to generate current account surpluses to service their debt obligations. Holding all else equal, this should enhance their borrowing capacity. Financial liberalization was also taking place within the EC, due to the elimination of capital controls and the adoption of new regulations which allowed European banks to operate branches in foreign nations subject to their home-country laws [European Central Bank (1999)].

To examine the reasons why increased financial integration appears to follow increased monetary integration, it is useful to distinguish between source-neutral and source-specific increases in borrowing and lending opportunities. For example, the impact of increased goods market integration on potential adverse terms of trade effects would appear to make EMU nations safer borrowers from any nation, rather than just their EMU partners. Similarly, if sovereign defaults occur on all creditor nations simultaneously, as appears to have been the case historically, then the creditworthiness arguments stressed by Gourinchas and Jeanne (2004) would also appear to be source-neutral.[1] In contrast, if entering into a monetary union facilitates borrowing by reducing currency risk, then we should not only see increased overall borrowing, but also a relative increase in borrowing from the monetary union partner nations.

It follows that bilateral information on the pattern of increased borrowing and lending by EMU member nations could help to identify the channels by which monetary and financial integration are linked. In this paper, I move in this direction by examining the impact of accession to the European Monetary Union on bilateral commercial bank lending. I look for evidence that accession to the EMU increased the relative bilateral

[1] Of course, if default were selective, then the Gourinchas and Jeanne (2002) effect could also increase the relative amount of financial integration with EMU partner nations.

financial integration with the rest of the EMU, in addition to the impact on the overall financial integration identified in the literature. The analysis therefore extends the aggregate evidence on financial integration in Blanchard and Giavazzi (2002) and Lane and Milesi-Ferretti (2003).

Consolidated data on bilateral foreign claims of reporting banks for twenty creditor countries and a large number of borrowing countries is available from the Bank for International Settlements (BIS) semi-annually from 1986.[2] Unfortunately, data on bilateral borrowing by the twenty creditor countries themselves was not released by the BIS prior to 1999. As the initial EMU partner nations tend to include prominent creditor countries, bilateral data is largely unavailable for these nations. For example, one cannot obtain commercial bank claims by the United Kingdom on France prior to the year 1999. As we are interested in assessing the impact of accession to the EMU on bilateral borrowing in that very year, this would appear to pose an insurmountable problem.

However, there is one exception. As Portugal was not a reporting BIS creditor country prior to 1999, bilateral claims on that country from all twenty creditor nations are available semi-annually both before and after the launch of the EMU. Disparities in lending to Portugal by EMU and non-EMU countries before and after the launch of the union can therefore provide an indicator of the impact of the monetary union on financial integration within the regime.

[2] The inclusion of conditioning variables reduces the sample of creditor countries to sixteen. The consolidated BIS figures may induce errors in measurement of cross-border obligations from a number of sources. First, the use of consolidated data may not correctly assign the risk of banks' foreign-branches. Second, "outward risk transfers" are sometimes used to transfer risks to residents of other countries, and this data set would not pick these up. Still, as these errors fall in the regressand of the specification they only make the effect of EMU accession harder to find and do not appear to introduce any bias issues.

There is evidence in the literature that both Portugal and Greece became more financially integrated with the rest of the world in the 1990s. Blanchard and Giavazzi (2002) note that Portugal reached a current account deficit in the year 2000 equal to about 10 percent of its GDP, while Greece reached a similar deficit between 6 and 7 percent of GDP in that year. These deficits had increased for these new and soon-to-be European Monetary Union (EMU) members from 2-3 and 1-2 percent respectively at the start of the decade. Lane and Milesi-Feretti (2003) report that external liabilities as a share of GDP grew 51.3 percent for Portugal from end 1996 through end-2000.

Blanchard and Giavazzi characterize their findings as an extension of Rose (2000), arguing that they suggest that monetary union also facilitates inter-temporal trade by allowing nations to run larger positive or negative current account balances. They describe the large increase in Portuguese borrowing as a "natural" outcome of increased international integration, as capital flows more freely as a result of the integration from rich to poor countries.[3]

In this paper, I investigate the impact of the launch of EMU on Portugal's bilateral borrowing patterns using a difference-in-differences specification. I compare the changes in bilateral commercial bank borrowing by Portugal from EMU-partner nations and non-EMU partner nations before and after the creation of the EMU.[4] I also offer some preliminary difference-in-differences evidence from the Greek experience before and after its EMU accession in 2001.

[3] Blanchard and Giavazzi also emphasize the role of domestic financial integration in the explosion in Portugal's current account deficit, but it is unclear that this channel would play a role in skewing the mix of international borrowing toward the EMU-partner creditor countries.

[4] For an overview of the difference-in-differences methodology, see Blundell and Macurdy (2000).

The difference-in-differences methodology has been used in a variety of applications to examine the impact of a policy intervention by establishing a control group to compare with the observed changes in the "treatment" group. In an international context, the difference-in-differences methodology has commonly been applied to compare a set of countries adopting some policy change with a control group that did not adopt the policy change. For example, Slaughter (2001) examines the impact of the adoption of trade liberalization policies by nations on income convergence in a difference-in-differences specification.

One might be concerned that Portugal is not a representative borrower, particularly during the sample period studied here. To some extent, that concern would be valid. At the time of its accession to the EMU, Portugal was a relatively new member of the European Community, having only entered in 1986. Moreover, in 1984 the nation had embarked on an extensive financial reform program. The government authorized new private entry into the banking system, which at the time included 12 state-owned banks, one domestic savings bank, and three foreign banks that had not been nationalized in 1975. New licenses were issued to seven banks and thirteen foreign institutions, and state-owned banks were gradually privatized with one exception from 1989 through 1996 [Canhoto and Dermine (2003)]. However, it is unclear why financial liberalization would act in favor of borrowing from EMU partner-nation banks at the expense of non-EC and EC-non-EMU banks. If anything, one would think that regulatory forces that might encourage borrowing from EMU partner nation banks would be mitigated by Portuguese financial reforms.

The relatively small size of the Portuguese economy may also be advantageous for this study from an econometric point of view. A common misgiving with difference-in-differences tests is that the membership in the group experiencing the intervention is dependent on the anticipated benefits of the intervention [e.g. Besley and Case (2000)]. In this case, the analysis would be distorted if the decision to join the EMU was affected by anticipated increased integration with Portugal. However, since the quantity of international borrowing by Portugal is small relative to lending by most of the euro-area creditor nations, that concern does not seem to be relevant here. I therefore proceed under the assumption that no creditor nation based its EMU entry decision on its anticipated increased financial integration with Portugal.

The results below demonstrate a statistically significant positive relationship between EMU integration and bilateral lending toward Portugal. Moreover, our estimates also appear to be significantly economically, as the point estimate on EMU integration indicates that being in a monetary union with Portugal triples the expected level of bilateral lending from that creditor country, holding all else equal. These results are robust to a number of sensitivity tests, including instrumenting for the possible endogeneity of bilateral trade, choosing earlier dates for the timing of "monetary integration," treating pre and post integration observations as single observations to account for possible serial correlation in the data, and using bilateral lending to Iceland as a difference-in-difference-in-differences (DDD) mechanism to control for shocks to creditor characteristics.

Finally, we subject bilateral Greek borrowing data to the same test and obtain similar results. Similar to the Portuguese experience, there was a large increase in overall

borrowing by Greece subsequent to its accession to EMU, and it skewed its pattern of borrowing towards obtaining funds from its EMU partner nations. The evidence from Greece must be classified as preliminary, because of the relatively recent timing of its accession. However, they support the conclusion that our Portuguese results reflect the general impact of accession to a monetary union rather than conditions that were specific to Portugal during its accession.

The remainder of this paper is organized into 7 sections. Section 2 provides some background on the events surrounding Portuguese accession to the EMU. Section 3 discusses the empirical specification and the data used in the study. Section 4 discusses our initial results. Section 5 conducts some robustness tests. Section 6 examines some corroborating evidence from Greece's experience with EMU accession. Section 7 concludes.

2. Portugal's Accession to the EC and the EMU

The major events surrounding the creation on the EMU are listed in Table 1. These events are well-known and have been summarized by the European Central Bank as taking place in three stages: The first stage stretched from the confirmation of the Delors report in 1989 calling for economic and monetary union, through the ratification of the Maastricht Treaty at the end of 1993. The second stage formally began with the establishment of the European Monetary Institute in 1994. Important developments in this stage included the determination of the January 1999 starting date in December 1995, the adoption of the Stability and Growth Pact in June 1997, and the announcement that the 11 original member countries were qualified for initial entry into the EMU in 1999.

Of course, Stage three began in January 1999 with the EMU's launch. For our purposes here, it is important to note that the long process leading up to the EMU implied that Portugal's entry into the union was widely anticipated, and likely led to a response in lending patterns long before the formal union launch date.

Portugal was a relatively late entrant into the European Community in 1986. This accession was accompanied by extensive liberalization of the nation's financial markets. As discussed by Canhoto and Dermine (2003), the process moved the country from a completely-nationalized banking system to one with almost exclusive privatized banking in a relatively short period. At the time when private banking was authorized in 1984, the banking sector consisted of 12 state-owned institutions, one domestic savings bank and three foreign banks. Moreover, the Portuguese government was using the distorted banking sector as an important revenue source to finance its large fiscal deficit [Borges (1990)].[5] By 1996, all of the state-owned banks except one had been nationalized and the domestic banking sector included thirteen foreign banks and seven new chartered private banks. Canhoto and Dermine (2003) demonstrate that these new banks had a significant positive impact on the overall efficiency of the Portuguese banking system.

Portugal's accession to the European Union may provide an alternative explanation to its 1999 EMU accession for the rapid increase in its current account deficit in the 1990s. Portugal's accession to the EU required the elimination of its capital controls and allowed banks from EU creditor nations to open branches within its borders subject to their home-country regulations. This increased competition across banks in the European Union. [e.g. European Central Bank (1999)] and eased terms faced by

[5] The taxation of the banking sector took place through a scheme whereby banks were forced to hold excess reserves at terms extremely favorable to the government. See Borges (1990) for details.

Portuguese borrowers. Subsequent to Portugal's entry into the EMU, Portuguese banks also enjoyed access to the liquid euro inter-bank loan market, where the common currency implied that neither lenders nor borrowers faced the currency risk commonly associated with international lending. The net indebtedness of Portuguese banks in 2000, 10.7 percent of GDP, exceeded its large current account deficit in that year.

Blanchard and Giavazzi (2002) also note that since the early 1990s developments in the European Union have led to an increased elasticity of demand for Portuguese exports towards the rest of the EC. These include the extension of safety requirements and distribution networks which have led Portuguese goods to be closer substitutes for those produced in the rest of the EC. This would make Portugal a more attractive borrower, as it would face a smaller decline in its terms of trade if it needed to generate a current account surplus to service its debt obligations. However, it is unclear that this latter development would systematically influence the pattern of Portuguese borrowing. The increased borrowing capacity from increased goods market integration should be just as high for non-EC countries as for EC, and even EMU partner, countries.

3. Empirics

3.1 Difference-in-differences specification

We begin with a standard difference-in-differences specification. Our sample consists of a group of N creditor nations, indexed by $i = 1,..., N$, observed over T periods, $t = 1,...,T$. Let d_{it} be our "policy indicator" variable. In our case, $d_{it} = 1$ if

creditor country i was in the monetary union at time t.[6] Let L_{it} represent the log of Portuguese borrowing from creditor country i at time t.

A conventional difference-in-differences specification for the impact of the European Monetary Union on Portuguese borrowing is

$$L_{it} = c + f_t + q_i + b_1 d_{it} + b_2 X_{it} + e_{it} \quad (1)$$

where f_t and q_i represent fixed time and creditor country effects respectively, X_{it} is a vector of conditioning variables, discussed below, and e_{it} is an i.i.d. disturbance term.[7]

This difference-in-differences methodology has been used in a wide variety of studies examining the impact of a policy change. The basic intuition is that the control group included in the sample provides information on how the experimental group would perform in the absence of the policy intervention.

A number of concerns commonly expressed about difference-in-differences exercises do not appear to be relevant here. First, it is clear that our sample satisfies the restriction implicit in (1) that the composition of the treatment and control groups remains stable over our sample period [e.g. Blundell and MaCurdy (2000)], as the identity of the initial group of EMU nations among BIS creditor countries (i.e. not including Greece) did not change over the course of our sample.

[6] Below, we conduct some sensitivity analysis tests concerning whether the impact of the creation of the monetary union may have occurred earlier than 1999. In these cases, $d_{it} = 1$ if nation i is an EMU partner nation and t is greater than or equal to our posited earlier dates of regime change.

[7] We also ran the specifications with random country effects and obtained similar results. These are available on request.

Another major concern in difference-in-differences exercises [e.g. Besley and Case (2000)] is that the identity of the policy and control groups is endogenous to the anticipated impacts of the policy change. This is particularly true for cross-country studies. However, as discussed above, this does not appear to be a particular concern in our study because of the limited size of Portugal relative to the rest of the EMU nations.

Nevertheless, difference-in-differences exercises have received a high degree of scrutiny because of the restrictive assumptions implicit in specifications such as that in (1). Below, I conduct a number of robustness checks to address a variety of econometric concerns.

3.2 Data

I use consolidated BIS data on foreign claims of reporting banks for sixteen creditor countries on Portugal from the second quarter of 1985 through the second quarter of 2003. The creditor countries in our sample include Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, and the United States.[8] The data is available semi-annually.[9] All data is converted to 1995 real U.S. dollars, deflated by the consumer price index.

Our base dependent variable is L_{it}, the log of Portuguese borrowing from creditor country *i* at time *t*. Many of the bilateral claims are reported to be zero. This leaves our

[8] Several countries had missing observations and were filled in through interpolation, including Canada 1999 Q2; Denmark 1999 Q2, 2000 Q2, 2000 Q4; Italy 2001 Q4; and Norway 1999 Q2. Norway also had missing data from 1985 Q4 to 1993 Q4. Because its starting value in 1994 Q2 was so small ($4 million), values for prior observations were set to zero.

[9] Represents second and fourth quarter figures. Data is available quarterly beginning in 1999, but cannot be used for a difference-in-differences exercise at that frequency as the intervention also occurred in 1999.

log transformation potentially influential and questionable. We therefore examine the robustness of our results to avoiding this transformation below.

Our conditioning variables include EC_i, a dummy variable that takes value 1 if creditor country *i* is a European Community member, and value zero otherwise; GDP_{it}, the log of total real gross domestic product of creditor *i* at time *t;* GDP/POP_{it}, the log of real gross domestic product per capita of creditor *i* at time *t;* $Trade_{it}$, the log of total real bilateral trade between creditor country *i* and Portugal at time *t;* $Loans/GDP_{it}$, the ratio of total foreign commercial bank claims of creditor *i* to gross domestic product at time *t;* $Dist_i$, the log of distance between creditor country *i* and Portugal; $Landlocked_i$, a dummy variable that takes value 1 if creditor country *i* is landlocked,[10] and $Area_i$, the log of the of the land area of creditor country *i.*

Concerning the conditioning variables, data for $Dist_i$ and $Area_i$ came from Rose (2004). Data for GDP_{it} and GDP/POP_{it} came from the World Development Indicators. $Trade_{it}$ is the total value of exports and imports in 1995 US dollars between Portugal and a particular country using export and import data from the *International Monetary Fund Direction of Trade Statistics*.[11]

Summary statistics for bi-lateral lending are shown in Table 1, while the share of bilateral lending from EMU partner nations is shown in Figure 1. Overall, the bilateral lending patterns reveal a movement towards concentrating borrowing away from non-EC

[10] The only landlocked nations in our sample are Austria and Switzerland.

[11] Trade data was missing for Belgium from 1985 to 1996 while total trade between Belgium and Portugal equaled zero in 1997 and 1998. This means Belgium was listed as missing total trade data in logs for the period 1985 Q4-1998 Q4.

nations and towards the EMU partner nations in the study. For example, over 47 percent of borrowing during the 1986-1991 period came from the non-EC creditor countries in our sample. Subsequent to Portuguese accession to the EMU, that share fell to 4.8 percent. In contrast, the share of borrowing from the EMU-partner nations in the sample more than doubled, from 37.5 percent of overall borrowing in the initial period to 85.6 percent of overall borrowing after 1999.

Borrowing from the non-EMU EC countries in the sample also increased dramatically, from approximately 3.5 billion dollars in the initial period to over 11.7 billion dollars subsequent to 1999. However, the share of borrowing from the non-EMU EC countries in the sample fell from 15 percent to 9.6 percent. This raises the possibility that the provision of financial services were diverted from non-EMU countries.

As mentioned above, the long process leading up to the EMU was likely to lead to a response in lending patterns long before the formal union launch date. Looking at the changes in market share in the various periods in our sample in Figure 1, it is clear that lending patterns to Portugal, particularly those from prospective EMU-partner countries, changed dramatically long before the EMU's formal launch.

The reasons behind this anticipatory effect are beyond the scope of this paper. It may reflect an effort by EMU member-country banks to establish market share at the expense of other EMU member-country banks under the expectation (which proved correct) that the pattern of Portuguese borrowing would shift towards EMU-partner nations subsequent to the launch of the monetary union. Alternatively, it may imply that true fundamentals in the relative riskiness of Portuguese borrowing from member states to other potential creditors had changed prior to formal EMU launch. For our purposes, it

reveals that we must careful about timing the date of the EMU policy intervention. Below, we establish that our results are robust to the designation of earlier events in the history of Portuguese accession to the EMU as the timing of the policy change.

Bilateral lending to Portugal from the individual EMU-partner nations is shown in Table 3. Growth rates in Portuguese lending across the EMU partner nations in the sample were quite heterogeneous. The gains in bilateral lending shares were primarily enjoyed by banks originating in Germany, Spain and Italy. Combined, the share of borrowing from these three nations increased from 17.1 percent for the pre-1991 period to 67.4 percent for the post-1999 period. Spain in particular experienced an increase from a 5.6 percent borrowing share to a 32.3 percent share.

In contrast, while France saw its quantity of lending more than double over the same period, its market share declined dramatically from an average of 11.9 percent prior to 1991 to an average of 7.2 percent subsequent to the 1999 launch of the EMU.

4. Results

The results using ordinary least squares estimation are shown in Table 4. Model 1 reports the results with the *EMU99* variable alone, while Model 2 adds the *EC* variable. Model 3 adds the time-varying creditor country conditioning variables, GDP_{it}, GDP/POP_{it}, $Trade_{it}$, and $Loans/GDP_{it}$, while Model 4 adds the time-invariant creditor country conditioning variables, $Dist_i$, $Landlocked_i$, and $Area_i$ and drops the country fixed effect dummies. Models 5 and 6 repeat Models 3 and 4 respectively with the likely endogenous $Trade_{it}$ variable removed. As such, these specifications can be considered "reduced form" specifications, while we pursue an explicit instrumental variables

exercise below. Finally, Model 7 repeats the full specification with the dependent variable measured in levels.

The primary result is that our variable of interest, $EMU99_{it}$ enters robustly at a positive and statistically significant level in all of our specifications. Moreover, the estimated coefficient value suggests economic significance, as the parameter estimate ranges from a low level of 0.88 in Model 5 to a high of 1.11 in Models 1 and 2. To interpret the magnitude of that coefficient, consider that in our sample period the average level of Portuguese borrowing was approximately 536 million dollars, or 20.1 in logs. An increase of 1.00 in logs (which approximates the midpoint of our estimated coefficient values) would correspond to a predicted increase in borrowing holding all else equal of over 921 million dollars, almost tripling to a total of 1.46 billion dollars.

Concerning the conditioning variables, the *EC* variable is surprisingly non-robust, switching from positive to negative values depending on the specification. However, one must remember that these specifications include country fixed effects, leaving the interpretation of the *EC* variable difficult in light of the fact that the status of all countries with respect to the European Community remained unchanged for the course of the sample. The $Trade_{it}$ variable is positive and statistically significant, confirming the results of Rose and Spiegel (2004) for the Portugal sub-sample that countries tend to borrow more from the creditor countries they trade with more. The $Loans/GDP_{it}$ variable also enters robustly positively, suggesting that countries borrow more from creditor countries that are engaging in more lending generally. This result is not surprising. However, the results for the $Area_i$ variable are surprising. This variable enters robustly negatively at statistically significant levels. This result may reflect the

fact that Portugal tends to borrow more from the rest of Europe, whose nations tend to be of smaller physical size, holding all else equal. The remaining conditioning variables, GDP/POP_{it}, $Dist_i$, and $Landlocked_i$ either reverse sign or enter insignificantly in one or more of the specifications.

Finally, the results in Model 7 demonstrate that the positive and significant result for the *EMU99* variable is robust to its measurement in levels rather than logs.

5. Robustness Checks

5.1 Earlier Intervention Dates

As mentioned above, Portugal's entry into the EMU was anything but a surprise, as the movement of the partner nations towards EMU was closely followed by both policy makers and the media. This would be a problem for our difference-in-differences specification if lending patterns changed in anticipation of the EMU launch at earlier dates than the 1999 launch considered in Table 1. To investigate this possibility, I repeat the specification in models 2,3, and 4 for earlier break dates. *EMU94* is an intervention dummy that equals one if the creditor country is an EMU partner nation and the time period is after the beginning of 1994 and *EMU96* is an intervention dummy that equals one if the creditor country is an EMU partner nation and the time period is after the beginning of 1996. These earlier intervention dates correspond to the ratification of the Maastricht Treaty at the end of 1993 and the announcement of the launch date for the EMU at the end of 1995 respectively.

The results with these alternative intervention dates are shown in Table 5. It can be seen that the intervention variable is again positive and significant for all of the

specifications. Moreover, the estimated coefficient value is of comparable magnitude, suggesting an economically significant impact of the anticipated EMU accession.

Concerning the conditioning variables, the $Trade_{it}$ variable is again positive and statistically significant, as is the $Loans/GDP_{it}$ variable. We again obtain a significant negative coefficient estimate for the $Area_i$ variable.

5.2 Instrumental Variables

It is possible that a creditor country's bilateral trade with Portugal is influenced by its intensity of lending to that nation for a number of reasons. First, there is likely to be an information advantage to producers in creditor countries with more Portuguese business relations, including lending relations. This may give exporters from creditor countries with more lending to Portugal a competitive edge over those from nations with less financial contact. Second, it is likely that banks with more Portuguese experience would be better placed to underwrite loans to other Portuguese exporters, again conferring an informational advantage.

These issues raise the possibility of endogeneity in the $Trade_{it}$ regressor. To address this endogeneity I use instrumental variables. I use three instrumental variables for bilateral trade. These include the log of distance between the countries; whether or not the creditor country is landlocked; and the log of the creditor country's area. I drop these variables from the second stage equation, leaving the remaining variables as controls. I then repeat the instrumental variables estimation for the earlier 1994 and 1996 intervention dates.

The estimates are tabulated in Table 5. It can be seen that the variable of interest, *EMU99,* is robust to instrumenting for the bilateral trade variable and retains its qualitative magnitude. The coefficient estimate for *EMU99* is 0.85. The results with the earlier intervention dates are similar.

As a robustness check concerning the instruments used, I also used lagged values of the temporal independent variables, including *Loans/GDP*, *Distance,* and *Landlocked.* The results with these alternative instruments are reported in the final two columns of Table 6. While the coefficient estimate on the *EMU99* variable decreases slightly to 0.67, it still enters at a statistically and economically significant level.

5.3 Serial correlation

Finally, there is the issue of serial correlation in conventional difference-in-differences applications discussed by Bertrand et al (2004). As Bertrand et al demonstrate, the high degree of serial correlation in both the dependent and policy variables commonly used in panel difference-in-differences exercises typically leads to an overstatement of the number of independent observations in one's sample.

A simple robustness check advocated by Bertrand, et al to deal with this issue is to remove the time dimension in the sample by aggregating the data into two time periods. This approach can only work for applications where the treatment is supplied simultaneously, which is uncommon in the literature examining, for example, passage of minimum wage laws across states. Nevertheless, this condition is clearly met in the case of accession to EMU, at least for the creditor countries in our sample. All of the nations in our sample entered the EMU on the same date or failed to enter at all.

The results with observations collapsed into one before and after for each creditor country are shown in Table 7 using both OLS estimation and instrumental variables. To account for time fixed effect, a single *Post99* dummy variable is now included.

It can be seen that the number of observations is rather small (31), but the *EMU99* variable again enters significantly positive using both estimation methods with an even larger raw coefficient estimate. This suggests that our primary result is robust to accounting for the possibility of serial correlation in the data.

5.4 Difference-in-difference-in-differences results

The analysis above used explicit proxies to condition for differences in creditor country characteristics. An alternative approach that is commonly used in the literature is to pair the dependent variable with another variable that shares common characteristics, except for the lack of the policy intervention. This method is commonly called a difference-in-difference-in-differences (DDD) approach because it examines the difference between the differences with the control variable between the experiment group and the control group.

In our case, consider two equations similar to that of equation (1) for the experiment group and for the control group:

$$L_{it}^{e} = c^{e} + f_{t}^{e} + q_{t}^{e} + b_{1}d_{it} + b_{2}X_{it} + b_{3}X_{it}^{e} + e_{it}^{e} \quad (2)$$

$$L_{it}^{c} = c^{c} + f_{t}^{c} + q_{t}^{c} + b_{2}X_{it} + b_{3}X_{it}^{c} + e_{it}^{c}. \quad (3)$$

where X_{it} represents the vector of creditor country characteristics that are invariant with repect to the debtor country and X_{it}^{e} and X_{it}^{c} represent conditioning variables that differ across creditor countries, such as bilateral trade and distance levels. Note that the

intervention term is missing from the equation for the control group (3). Subtracting (3) from (2) yields

$$\tilde{L}_{it} = \tilde{c} + \tilde{f}_t + \tilde{q}_i + b_1 d_{it} + b_3 \left(X_{it}^e - X_{it}^c \right) + \tilde{e}_{it} \qquad (4)$$

where $\tilde{x} = x^c - x^e$. Equation (4) is a DDD specification. This specification takes advantage of the assumption the creditor-country specific shocks will be expected to affect lending to the control group in the same way on average as the experiment group to allow us to substitute out for the X_{it}'s, i.e. the creditor characteristics that are common across the experimental and control groups.

In our case, the experimental group is a panel of bilateral commercial bank lending to Portugal. Ideally, we would want to use a matching panel of lending to another European debtor nation as a control. However, as discussed above, data for bilateral lending is available only for a small set of European debtor nations. We were limited to the choice of Iceland and Andorra, which led to the choice of Iceland as a control debtor nation. Iceland is a useful control country because it is neither an EMU nor an EU member nation, but it is a European country whose bilateral borrowing pattern is likely to be affected similarly by shocks to the creditor nation.

The results with Iceland as a control are shown in Table 8. The *EMU99* variable of interest is again highly significant for both the ordinary least squares and the instrumental variables specifications. This is true with or without the inclusion of the bilateral conditioning variables, which all enter significantly with their expected signs. The results indicate that the specification is robust to using bilateral lending to Iceland as an alternative control for creditor country characteristics.

6. Preliminary Corroborating Evidence from Greece

Greece was a late entrant into the EMU at the beginning of 2001. Because the sample only extends through the end of 2002, this only gives us 4 observations to examine whether the composition of Greek borrowing was also focused towards its EMU partners after its accession to the monetary union. However, I present this preliminary evidence as corroborating evidence to the Portuguese results above.

That the experience of Greece was quite similar can be seen from Figure 2, which depicts the share of Greek borrowing from the EMU creditor nations. As in the case of Portugal, the composition of Greek borrowing was skewed away from the non-EC nations towards Greece's new EMU partner nations. Moreover, the rapid growth in lending by EMU partner nations to Greece took place a little later than it did for Portugal, which would be consistent with the claim that EMU accession triggered the increase in bilateral lending. From 1986 through 1991, Greece borrowed more from non-EC nations than it did from its future EMU partner nations. This pattern was so significantly reversed that by 2002, Greek borrowing from its EMU-partner nations was over seven times the size of its borrowing from the non-EC countries in the sample.

The results for a difference-in-differences exercise for Greece with 2001 as the intervention date are shown in Table 9 for both OLS and instrumental variables panel specifications.[12] It can be seen that the *EMU01* is positive and significant with a coefficient estimate of 1.2 for the fully-specified OLS model and 0.91 for the second stage of the instrumental variables specification. These results indicate that Greece accession to the EMU resulted in the same change in borrowing patterns as Portugal:

[12] The Greek results were also robust to the specification of earlier intervention dates, including the beginning of 1999, the launch of the EMU, and 1996, the announcement of the 1999 launch date. These results are available from the author on request.

There was a large increase in overall borrowing and a skewing of the pattern of borrowing towards obtaining funds from EMU partner nations.

7. Conclusion

This paper provides evidence from bilateral Portuguese borrowing patterns before and after the creation of the EMU that the accession of Portugal to the EMU resulted in its skewing its borrowing towards its EMU-partner nations and away from non-partner nations. This extends the literature that demonstrated that overall borrowing increased dramatically as a result of Portuguese accession to the European Monetary Union.

This evidence was corroborated by the evidence from Greece, which also suggests that Greek EMU-accession resulted in a skewing of its borrowing towards its EMU partners. Although the evidence is somewhat preliminary, the Greek evidence is important in that some of the changes in Portuguese borrowing pattrerns may reflect the dramatic financial liberalization that took place subsequent to Portugal's entry into the European Community. While Greece also engaged in financial liberalization, the scope of changes were not nearly as dramatic as those experienced by Portugal.

The results therefore strongly suggest that monetary integration facilitates financial integration. Moreover, these results suggest that the enhanced borrowing opportunities are not "source-neutral," such as Portugal joining the EMU becoming an overall safer borrower, but rather are skewed towards enhanced borrowing opportunities from the monetary union partner nations. As discussed in the introduction, these might include enhanced default penalties from monetary union partners or the reduced currency risk associated with lending to monetary union partners.

The potentially dark side of these enhanced borrowing opportunities is the financial diversion away from non-partner creditor countries. The evidence of financial diversion in this study suggests that one should be cautious in concluding that the enhanced financial integration resulting from the monetary unions was unambiguously welfare enhancing. Just as in the case of trade diversion, the possibility that monetary integration raises the possibility of diversion in the provision of financial services implies some chance of welfare reduction for these nations. It seems likely that non-EMU commercial banks will suffer some losses from their reduced market share in Portuguese lending.

It seems more likely, however, the financial diversion effect is the result of true cost reductions in borrowing from monetary union partner nations, such as those that would emerge from a reduction in currency risk associated with international borrowing. If this were the case, it would be likely that the "global welfare" from monetary integration would be increased by considering the impact on financial integration.

It should be noted that the large change in the pattern of lending does not necessarily imply a large welfare gain. It is possible that a representative Portuguese borrower could be almost indifferent between borrowing from an EMU partner nation and someone outside the EMU prior to accession, but the reduced currency risk subsequent to accession tips the loan to the EMU-partner creditor. In this case, we could see the dramatic change in the pattern of lending demonstrated above, but a relatively modest welfare gain. However, the large increase in the overall current account deficits experienced by both Portugal and Greece suggests that accession did convey a significant increase in overall borrowing capacity. Consequently, one would expect that the

enhanced borrowing opportunities afforded by accession conferred non-trivial welfare gains.

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Table 1: Events Surrounding Portugal's Accession to the EMU

6/89	European Council Confirms Delors Report Outlining Steps for Achieving Monetary Union
6/90	Restrictions on capital movements between member states abolished
12/91	Maastricht Treaty on European Union Announced
2/92	Maastricht Treaty Signed
11/93	Treaty Ratified; Protocol of European System of Central Banks and European Monetary Institute Established
1/94	European Monetary Institute Established
12/95	Launch Date for Establishment of Euro Established
12/97	Adoption of Stability and Growth Pact
5/98	Euro-11 Countries Announced
1/99	European Monetary Union Launched
6/00	EU Council Decides Greece Qualified for EMU Admission
1/01	Greece Enters EMU

Table 2: Summary Statistics

1. Commercial Bank Exposure to Portugal

	1986-1991	*1992-1995*	*1996-1998*	*1999-2002*
Non-EC Countries	11,066 (47.5%)	7,201 (16.3%)	4,318 (7.3%)	5,847 (4.8%)
Non-EMU EC Countries	3,498 (15.0%)	4,460 (10.1%)	6,753 (11.3%)	11,744 (9.6%)
EMU Countries	8,720 (37.5%)	32,589 (73.6%)	48,445 (81.4%)	104,356 (85.6%)
Total	23,284	44,250	59,516	121,947

2. Total Trade by Creditor Countries with Portugal

	1986-1991	*1992-1995*	*1996-1998*	*1999-2002*
Non-EC Countries	18,011 (9.8 %)	12,251 (7.6 %)	10,070 (7.3 %)	12,969 (6.9 %)
Non-EMU EC Countries	39,013 (21.2 %)	29,187 (18.0 %)	23,104 (16.8 %)	27,217 (14.5 %)
EMU Countries	126,994 (69.0 %)	120,463 (74.4 %)	104,323 (75.9 %)	147,138 (78.5 %)
Total	184,018	161,901	137,497	187,324

Notes: Millions of 1995 U.S. dollars. EMU creditor countries in the sample include Austria, Belgium, Finland, France, Germany, Italy, Netherlands, and Spain. Non-EMU EC creditor countries include Denmark, Norway, Sweden, and the United Kingdom. Non-EC creditor countries include Canada, Japan, Switzerland, and the United States

Table 3: Bilateral Lending to Portugal by EMU-partner Countries
(Annual Averages)

EMU Countries	1986-1991	1992-1995	1996-1998	1999-2002
Austria	1,603 (1.1%)	2,172 (1.2%)	2,180 (1.2%)	3,756 (0.8%)
Belgium	7,518 (5.4%)	9,957 (5.6%)	10,664 (6.0%)	25,573 (5.2%)
Finland	536 (0.4%)	127 (0.1%)	52 (0.0%)	630 (0.1%)
France	16,555 (11.9%)	19,793 (11.2%)	23,392 (13.1%)	35,123 (7.2%)
Germany	12,461 (8.9%)	31,295 (17.7%)	47,318 (26.5%)	121,060 (24.8%)
Italy	3,620 (2.6%)	4,335 (2.4%)	9,328 (5.2%)	50,196 (10.3%)
Netherlands	2,178 (1.6%)	3,060 (1.7%)	9,601 (5.4%)	23,521 (4.8%)
Spain	7,846 (5.6%)	59,616 (33.7%)	42,800 (24.0%)	157,566 (32.3%)

Note: Source: Bank for International Settlements. Millions of 1995 U.S. dollars. Terms in parentheses represents average share of total borrowing by Portugal from reporting creditor nation.

Table 4: Ordinary Least Squares Results

Dependent variable: Log of bi-lateral commercial bank claims on Portugal

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	18.70**	18.21**	-3.76	-6.28**	-163.76**	0.17	-5.02e+9**
	(0.28)	(0.32)	(25.46)	(2.25)	(19.29)	(2.34)	(1.95e+8)
EMU99	1.11**	1.11**	0.71**	0.88**	1.06**	1.07**	2.90e+9**
	(0.14)	(0.15)	(0.15)	(0.14)	(0.15)	(0.14)	(4.63e+8)
EC		1.31**	-4.49**	-2.20**	7.55**	-1.25**	2.44e+9*
		(0.20)	(1.61)	(0.24)	(0.61)	(0.25)	(1.37e+9)
GDP			-2.38*	0.36**	7.06**	1.26**	-0.004**
			(1.28)	(0.12)	(0.55)	(0.04)	(0.000)
GDP/POP			6.38**	-0.06	-0.79	-0.01	7746.39
			(1.48)	(0.16)	(1.14)	(0.18)	(14480)
Trade			1.28**	1.17**			1.13**
			(0.17)	(0.15)			(0.11)
Loans/GDP			0.22**	0.21**	0.16**	0.24**	2.36e+8*
			(0.06)	(0.05)	(0.05)	(0.06)	(1.45e+8)
Distance				-0.24		-1.23**	1348e+3**
				(0.18)		(0.12)	(3128e+2)
Landlocked				1.35**		0.14	1.50e+9**
				(0.17)		(0.10)	(3.72e+8)
Area				-0.27**		-0.38**	134.28
				(0.04)		(0.04)	(86.75)
# Obs	559	559	514	514	541	541	518
R^2	0.84	0.81	0.87	0.85	0.84	0.81	0.73
F-Statistic	64.67	56.79	79.28	77.14	64.79	59.46	10.38

Note: *EMU99* takes value 1 if creditor country is a euro area partner for observations beginning in 1999 and value 0 otherwise. Specifications include creditor country and time dummies, except for 4,6,and 7 which include only time dummies. Dummy coefficients are suppressed and are available on request. Standard errors are estimated with White's heteroskedasticity correction. All non-dummy variables variable are measured in logs, except for the *Loans/GDP* ratio, with the exception of model 7, which measures all variables in levels. ** indicates statistical significance at 5 percent confidence level. * indicates statistical significance at 10 percent confidence level.

Table 5: Results for Earlier Break Dates

Dependent variable: Log of bi-lateral commercial bank claims on Portugal

	Model 2	Model 3	Model 4	Model 2	Model 3	Model 4
Constant	18.42** (0.30)	-27.74 (25.03)	-6.61** (2.13)	18.31** (0.32)	-19.49 (25.33)	-6.40** (2.20)
EMU94	1.27** (0.13)	0.81** (0.14)	0.66** (0.11)			
EMU96				1.12** (0.14)	0.67** (0.15)	0.69** (0.12)
EC	0.92** (0.20)	-2.69 (1.65)	-2.29** (0.24)	1.12** (0.21)	-3.35** (1.66)	-2.24** (0.24)
GDP		-0.84 (1.30)	0.35** (0.12)		-1.42 (1.31)	0.36** (0.12)
GDP/POP		4.93** (1.57)	0.05 (0.16)		5.53** (1.55)	0.01 (0.17)
Trade		1.11** (0.17)	1.15** (0.15)		1.19** (0.18)	1.15** (0.17)
Loans/GDP		0.20** (0.06)	0.21** (0.06)		0.20** (0.06)	0.21** (0.06)
Distance			-0.26 (0.17)			-0.26 (0.17)
Landlocked			1.30** (0.17)			1.31** (0.17)
Area			-0.27** (0.04)			-0.27** (0.04)
# Obs	559	514	514	559	514	514
R^2	0.82	0.87	0.85	0.82	0.87	0.85
F-Statistic	70.06	89.49	82.71	62.99	89.04	86.03

Note: *EMU96* takes value 1 if creditor country is a euro area partner for observations beginning in 1996 and value 0 otherwise. *EMU94* takes value 1 if creditor country is a euro area partner for observations beginning in 1994 and value 0 otherwise. Specifications include creditor country and time dummies, except for 4 which includes only time dummies. Dummy coefficients are suppressed and are available on request. Standard errors are estimated with White's heteroskedasticity correction. All non-dummy variables variable are measured in logs, except for the *Loans/GDP* ratio, with the exception of model 7, which measures all variables in levels. ** indicates statistical significance at 5 percent confidence level. * indicates statistical significance at 10 percent confidence level.

Table 6: IV Results

Dependent variables:
First Stage: Log of Total Bi-lateral Trade with Portugal
Second Stage: Log of bi-lateral commercial bank claims on Portugal

	EMU99 Stage 1	*EMU99* Stage 2	*EMU96* Stage 1	*EMU96* Stage 2	*EMU94* Stage 1	*EMU94* Stage 2	*EMU99* Stage 1	*EMU99* Stage 2
Constant	52.40** (8.82)	-35.50 (28.82)	45.17** (8.62)	-48.46 (30.19)	43.47** (8.49)	-53.62* (30.25)	49.91** (10.73)	-116.43* (68.44)
EMU	0.15** (0.04)	0.85** (0.16)	0.22** (0.03)	0.81** (0.16)	0.25** (0.03)	0.93** (0.16)	0.14** (0.04)	0.67** (0.21)
EC	Dropped	-2.25 (2.01)	Dropped	-1.28 (2.14)	Dropped	-0.84 (2.13)	Dropped	0.67 (10.74)
GDP	-2.69** (0.52)	-0.56 (1.57)	-2.18** (0.51)	0.26 (1.68)	-2.05** (0.50)	0.68 (1.67)	3.36 (2.67)	2.26 (2.97)
GDP/POP	4.69** (0.56)	5.36** (1.70)	4.08** (0.55)	4.51** (1.80)	3.91** (0.54)	3.98** (1.81)	-4.89* (2.76)	0.24 (4.29)
Trade		0.89** (0.21)		0.85** (0.23)		0.81** (0.23)		2.16** (0.95)
Loans/GDP	-0.03* (0.02)	0.23** (0.06)	-0.03* (0.02)	0.21** (0.06)	-0.04* (0.02)	0.20** (0.07)	-0.05 (0.05)	0.27** (0.07)
Distance	-2.56** (0.21)		-2.33** (0.21)		-2.25** (0.20)		1.21** (0.52)	5.80** (2.71)
Landlocked	-2.74** (0.23)		-2.51** (0.23)		-2.46** (0.22)		-0.78** (0.10)	2.77** (0.89)
Area	0.85** (0.14)		0.71** (0.14)		0.67** (0.14)		-1.68** (0.30)	-1.05 (2.03)
Lag GDP							-5.30** (2.65)	
Lag GDP/POP							8.80** (2.71)	
Lag Loans/GDP							0.02 (0.06)	
# Obs	514	514	514	514	514	514	499	499
R^2	0.98	0.87	0.98	0.87	0.98	0.87	0.98	0.87
F-Statistic	419.04	74.38	448.41	84.45	463.00	84.87	447.37	78.30

Note: *EMUxx* takes value 1 if creditor country is a euro area partner for observations beginning in 19xx and value 0 otherwise. Specifications include creditor country and time dummies. Dummy coefficients are suppressed and are available on request. Standard errors are estimated with White's heteroskedasticity correction. Final specification includes lagged values of *Loans/GDP*, *Distance*, and *Landlocked* in first stage as instruments. ** indicates statistical significance at 5 percent confidence level. * indicates statistical significance at 10 percent confidence level.

Table 7: Two Observations per Creditor Country

Dependent variables:

First Stage: Log of Total Bi-lateral Trade with Portugal
Second Stage: Log of bi-lateral commercial bank claims on Portugal

	OLS Results		2SLS Results	
			First Stage	Second Stage
Constant	0.82 (5.98)		3.02 (2.64)	-13.53** (6.15)
EMU99	1.34** (0.26)		0.09 (0.12)	1.56** (0.33)
EC	-1.86** (0.77)		1.21** (0.23)	-0.47 (0.96)
lnGDP	0.73 (0.43)		0.88** (0.04)	0.57 (0.36)
lnGDP/POP	-0.51 (0.53)		-0.01 (0.24)	0.12 (0.66)
lnTrade	0.66 (0.48)			0.79** (0.36)
Loans/GDP	0.29 (0.18)		0.04 (0.08)	0.77** (0.15)
lnDistance	-0.54 (0.47)		-0.86** (0.11)	
Landlocked	0.83 (0.58)		-1.03** (0.14)	
lnArea	-0.35** (0.10)		-0.04 (0.04)	
Post1999	0.04 (0.23)		-0.07 (0.11)	-0.31 (0.30)
# Obs	31		31	31
R^2	0.96		0.98	0.89
F-Statistic	47.39		117.52	40.91

Note: Observations represent level averages for pre and post EMU periods. *EMU99* takes value 1 if creditor country is a euro area partner for observations beginning in 1999 and value 0 otherwise. Standard errors are estimated with White's heteroskedasticity correction. Final specification includes lagged values of *Loans/GDP*, *Distance*, and *Landlocked* in first stage as instruments. ** indicates statistical significance at 5 percent confidence level. * indicates statistical significance at 10 percent confidence level.

Table 8: Difference-in-difference-in differences Results

Dependent variable: Difference in Log of bi-lateral commercial bank claims on Portugal and Iceland

	Model 2	Model 3	Model 5	EMU99 First Stage	EMU99 Second Stage
EMU1999	0.38** (0.11)	0.44** (0.11)	0.44** (0.11)	0.03 (0.03)	0.39** (0.13)
EC	2.46** (0.28)	3.86** (0.78)	0.21 (0.43)	1.81** (0.06)	-3.01** (0.30)
Diff Trade		0.58** (0.16)	0.58** (0.16)		2.36** (0.07)
Diff Distance			-1.71** (0.19)	-0.96** (0.01)	
# Obs	906	840	840	840	840
R^2	0.95	0.95	0.95	1.00	.
F-Statistic	497.82	485.35	485.35	3605.58	406.49

Note: *EMU1999* takes value 1 if creditor country is a euro area partner for observations beginning in 1999 and value 0 otherwise. First three columns represent OLS estimations, while final two columns represent first and second stages of instrumental variable estimation. All specifications include creditor country and time dummies. Dummy coefficients are suppressed and are available on request. Standard errors are estimated with White's heteroskedasticity correction. All non-dummy variables variable are measured in log differences. ** indicates statistical significance at 5 percent confidence level. * indicates statistical significance at 10 percent confidence level.

Table 8: Results from Greece

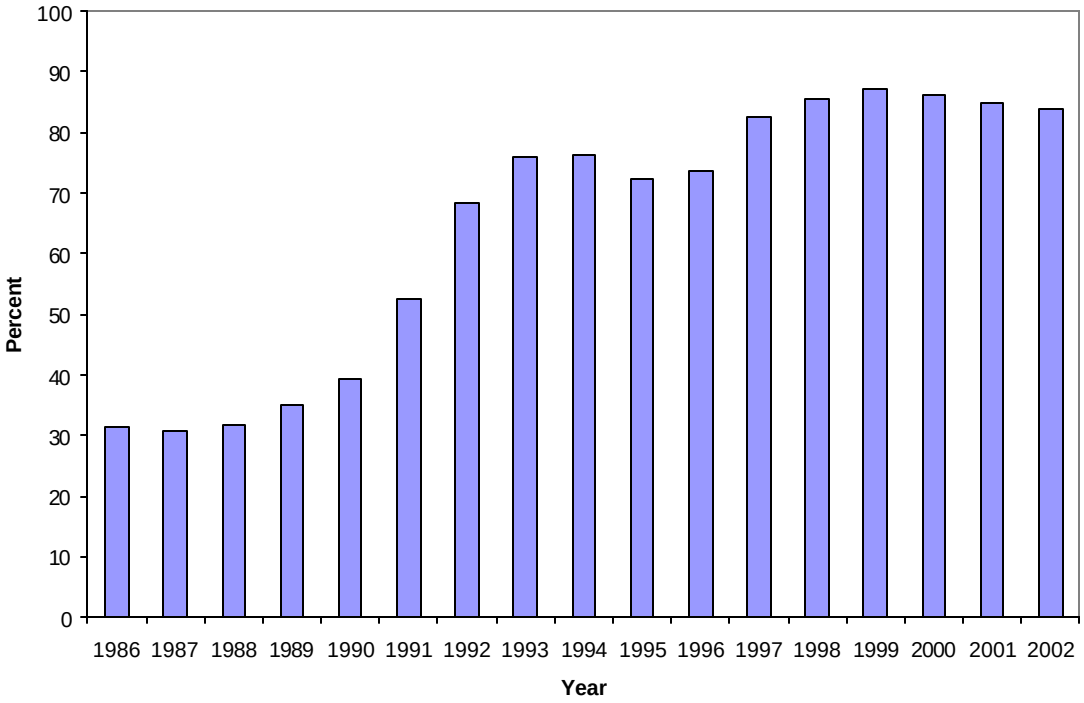
Dependent variable: Log of bi-lateral commercial bank claims on Portugal

	Model 2	Model 3	Model 5	*EMU99* First Stage	*EMU99* Second Stage
Constant	19.75** (0.17)	-14.04 (16.17)	-5.32** (2.16)	9.21 (10.14)	-40.10* (23.64)
EMU2001	1.03** (0.18)	0.92** (0.13)	1.20** (0.19)	-0.10** (0.05)	0.91** (0.13)
EC	0.06** (0.20)	-3.23** (0.95)	-0.13 (0.25)	Dropped	-1.20 (1.65)
GDP		-0.92 (0.73)	0.60** (0.12)	0.17 (0.51)	0.55 (1.22)
GDP/POP		5.09** (0.92)	-0.73** (0.16)	1.84** (0.55)	4.50** (1.03)
Trade		0.50** (0.12)	0.64** (0.11)		0.07 (0.30)
Loans/GDP		0.53** (0.06)	0.52** (0.08)	0.01 (0.02)	0.55** (0.06)
Distance			0.61** (0.17)	-1.99** (0.51)	
Landlocked			1.38** (0.15)	-2.25** (0.59)	
Area			0.09** (0.04)	0.21 (0.21)	
# Obs	557	514	514	514	514
R^2	0.87	0.90	0.81	0.98	0.90
F-Statistic	137.06	133.98	52.97	407.51	140.14

Note: *EMU01* takes value 1 if creditor country is a euro area partner for observations beginning in 2001 and value 0 otherwise. First three columns represent OLS estimations, while final two columns represent first and second stages of instrumental variable estimation. Specifications include creditor country and time dummies, except for 3 which includes only time dummies. Dummy coefficients are suppressed and are available on request. Standard errors are estimated with White's heteroskedasticity correction. All non-dummy variables variable are measured in logs. ** indicates statistical significance at 5 percent confidence level. * indicates statistical significance at 10 percent confidence level.

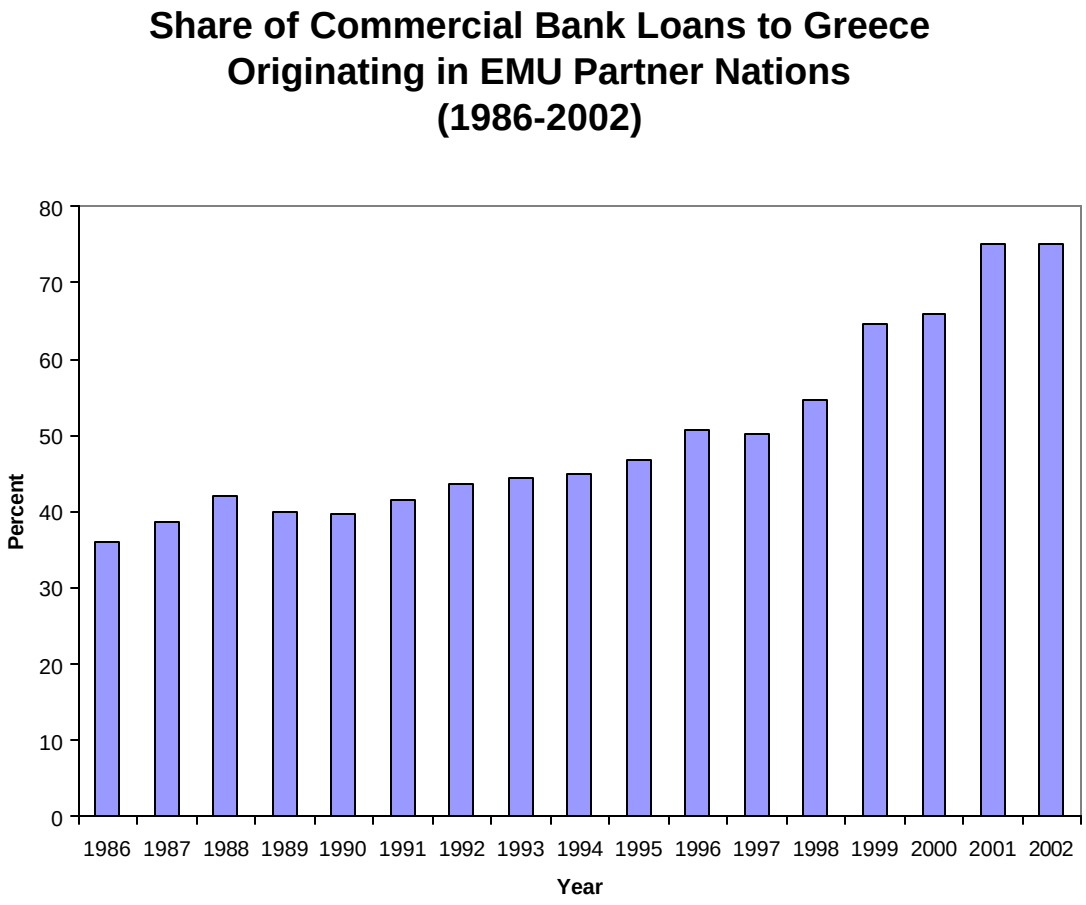
Figure 1

Share of Commercial Bank Loans to Portugal Originating in EMU Partner Nations (1986-2002)



Notes: Commercial bank lending to Portugal from EMU creditor nations as a share of total lending. EMU creditor nations include Austria, Belgium, Finland, France, Germany, Italy Netherlands, and Spain.

Figure 2



Notes: Commercial bank lending to Greece from EMU creditor nations as a share of total lending. EMU creditor nations include Austria, Belgium, Finland, France, Germany, Italy Netherlands, and Spain.