Chapter 10

Where does Capital Flow?
A Comparison of U.S. States and EU Countries 1950–2000.

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1 Introduction

Standard neoclassical models predict that capital will move from regions where the marginal product of capital is relatively low to regions where it is relatively high.[1] Within a fully integrated capital market with no "frictions," this implies that the capital stock will be highest in regions with the highest level of productivity. As shown by Blomstrom, Lipsey, and Zejan (1996) and Clark and Feenstra (2003), in a world of completely mobile capital the amount of physical capital installed in a country relative to the world average is fully explained by the relative level of total factor productivity.

In reality, the marginal product of capital may deviate from the return obtained by owners of capital, such as stock holders or direct owners, for numerous reasons. Risk-adjusted returns to investment may not be as high as suggested by simple neoclassical models for countries with low capital-labor ratios. Kraay and Ventura (2000) argue that low productivity countries' implied risk premiums on investment are quite high. Countries with low capital may also receive less foreign investment due to their low level of total factor productivity. Recent research show a positive relation between capital flows and various proxies for productivity, such as good institutions (Alfaro, Kalemli-Ozcan, Volosovych, 2007), low cost of physical capital (Hsieh and Klenow, 2007; Caselli and Feyrer, 2007), and low risk of default (Gertler and Rogoff, 1990; Reinhart and Rogoff, 2004). As a result capital might flow "uphill" from poor to rich countries rather than the opposite direction predicted by standard models. This observation is originally made by Lucas (1990) and recently discussed by Prasad et al. (2007) in the context of the 1990s globalization period. In a closely related paper, Gourinchas and Jeanne (2007) show that capital, on net, tends to go to low growth, rather than to the predicted high growth countries.

The pervasiveness of deviations of country-level data from the predictions of simple neoclassical models is such that one may question if such models are of any relevance in explaining capital flows. The disconnect between the models and the empirical evidence becomes more pressing in light of the recent global imbalances in capital flows—the answer to the question, "Where does capital flow?" is becoming of first-order policy importance.

[1]Essential parts of this paper were prepared while Bent Sørensen stayed at the European Commission from 29/5 to 6/6 2007 under the DG ECFIN Visiting Fellows Programme. He thanks the economists at the Commission for providing a stimulating research environment.

In the United States and the EU, where capital markets are supposed to be fully integrated, laws and institutions are intended to secure the free flow of capital. Two of the co-authors of the present paper have studied the patterns of capital flows between U.S. states in Kalemli-Ozcan, Reshef, Sørensen, and Yosha (2007) and between regions within the EU-countries in Ekinci, Kalemli-Ozcan, and Sørensen (2007). These studies show that capital flows between regions *within* countries such as the United States and Germany are consistent with the predictions of neoclassical models while those *between* European countries are not. An important question is then why capital is not flowing as freely between EU countries as between regions and whether this appears to be a permanent pattern or whether EU countries are becoming more like U.S. states.

We compare and contrast capital flows between U.S. states with capital flows between EU *countries*. Specifically we ask: Are EU countries becoming more like U.S. states? When did this process start? Does it appear to be an accelerating process? Does it include all EU countries or certain subsets? We take a recent historical perspective and compare the integration of U.S. capital markets since 1950 with that of EU countries since 1970. Our main goal is to highlight trends in financial integration and the direction of capital flows rather than systematically explore *why* integration may be imperfect.

In Europe, as well as in the United States, the northern countries and regions had high output and income levels early in the 20th century in comparison with their southern counterparts. In a setting of integrated markets capital should flow from capital abundant regions in the North to labor abundant regions in the South, but for various reasons this did not happen. In Europe, capital flows between countries were severely curtailed after the outbreak of World War I. Following a slow recovery in the 1920s capital flows were cut off by the great depression and World War II, and markets were only slowly opened in the post-War period culminating with the Maastricht Treaty allowing for free movements of capital between EU countries. In the United States, no formal barriers to capital flows existed but for various reasons capital did not flow South in the early part of the century. Caselli and Coleman (2001) argue that this was an equilibrium outcome where low schooling combined with an agrarian economy that gave scant reward to education kept many states in U.S. South at a level of low average productivity.

In their model North and South are equally efficient at producing non-farm goods. How-

ever, atmospheric and soil conditions give the South a comparative advantage in farming. The two regions freely trade in the two goods, and all factors (other than land) freely move across regional borders. This leads to an optimum allocation of resources in which the production of farm goods is concentrated in the South. Per capita income in the South is then lower because the labor input for farm goods is mostly low-skilled workers. As the economy grows, these mechanisms push increasing fractions of successive cohorts of southern workers out of lower-wage farming and into higher-wage manufacturing, while at the same time increasing relative wages for those southern workers remaining in farming. Both these features of the structural transformation therefore lead to regional convergence in average labor incomes. We do not attempt to add to this discussion but document the patterns of capital flows that followed the removal of barriers whatever these were.

We find that the United States in the 1950s and 1960s was characterized by strong "catch-up growth" in the South—consistent with the predictions of the simple neoclassical model. Income and output levels were converging to those of the North and capital was flowing from rich northern states to poorer southern states. However, we find no pattern of capital flowing to relatively poor states after the 1970s—if anything, capital flows to productive (rich) states within the United States. Our interpretation is that the "catch-up" phase is over in the United States and capital now flows to states that are hit by positive productivity shocks. In this situation, where "catch-up growth" is over, a state that has experienced a positive productivity shock will tend to be a high output state and, as a result, capital tend to flow to these high output states. For Europe, we find that capital has been flowing from the richer countries to the poorer countries since the 1970s, consistent with "catch-up growth," with no signs yet of this "catch-up" phase having run its course, except for the country of Ireland, which appears to be an outlier.

Our results can help understand the process of integration in Europe. "Catch-up growth" in the United States roughly was over 20 years after World War II, while it appears that the process is going to take a while longer for Europe. There can be many reasons why this process has not yet come to an end, ranging from government policy, regulations, and institutions broadly defined. We illustrate briefly that the level of financial integration is higher in countries with better institutions, measured as either an index of entry costs or an index of investor protection.

2 Comparing U.S. states to EU countries

2.1 The model

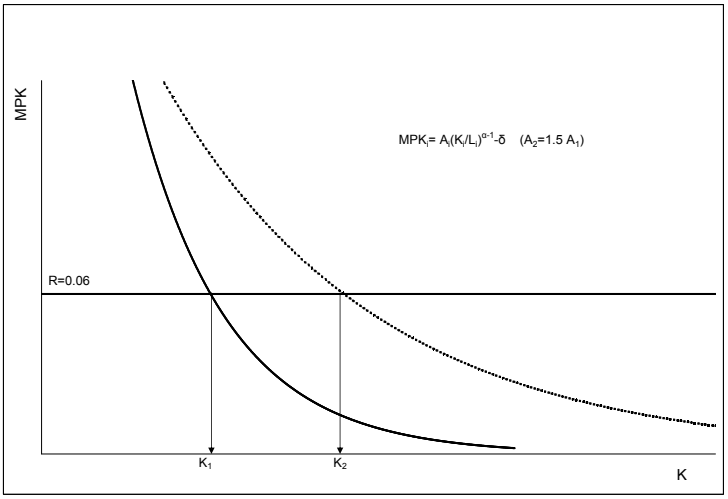
Our model ignores adjustment costs and business cycle patterns and is intended to characterize the "medium run." Figure 1 illustrates the relationship between the capital stock and its marginal product (MPK) when output is determined by a Cobb-Douglas function and highlights how this relationship depends on the level of productivity within a small open economy framework. Let K be the country's capital stock and A be its productivity level. The MPK schedule shows how marginal product varies as the capital stock increases. For a given labor force, L, productivity, A, and depreciation (δ), an increase in the capital stock, K, reduces its marginal product due to the law of diminishing returns.[2] Under the small economy assumption the world interest rate is constant (assumed to be 0.06). The domestic capital stock is determined by the equation $MPK = R$. In Figure 1, the level of the capital stock is K_1 for the least productive of the two regions illustrated. Holding labor constant, the equilibrium level of the capital stock is higher in a country with higher productivity, such as the second country in Figure 1 with capital stock K_2. The equilibrium capital stock K_2 corresponds to the MPK schedule given by the dashed line where productivity is higher (assumed to be 1.5 times higher than the productivity level corresponding to the solid MPK line; i.e., $A_2 = 1.5A_1$).

Kalemli-Ozcan, Reshef, Sorensen, Yosha (2007) show within a regression framework that capital in the United States tends to flow to fast growing states which also on average are high output states. They assume that each region's output is determined by a Cobb-Douglas production function where the level of "productivity" differs across regions and is subject to occasional shocks that last for a number of years. Such shocks can be purely technological but can also be regulatory shocks or relative price shocks. For example, the return to capital in regions that specialize in oil-extraction is a function of the world oil price.

Under the assumption that capital adjusts to the equilibrium level within one period (a "period" corresponds to, say, a decade in the data) following productivity shocks, this model predicts a positive relationship between capital flows and output growth. The mechanism is simply that productivity shocks leads to a higher growth and to a higher return to capital

[2]Note that the return to capital, α, is assumed to be 0.33.

Figure 1: Equilibrium Capital Stock as a Function of Productivity



as shown in Figure 1. Capital flows in, until the equilibrium is reached where returns are equalized in all regions. Thus, we define integrated capital markets to include the condition that the returns to capital are equated.

We will call capital markets "fully integrated" under the further condition that the ownership of capital is fully diversified. The model sketched in Figure 1 is deterministic, but we consider that an expository simplification of a model with uncertainty but no significant risk premia because of perfect diversification of capital ownership. Under this assumption, an increase in productivity in a region leads to an increase in output—Gross Domestic Product (GDP) or its regional counterpart—but is associated with a lower increase in income of the region—Gross National Income (GNI). Why? Simply because the increase in productivity leads to a higher return to capital installed in the country and this capital is mainly owned by residents of other regions (assuming that each region is small compared to the total area under consideration).[3]

[3]This assumption holds to a first degree approximation for U.S. states compared to the total United States and for EU countries compared to the total EU.

For countries, this prediction automatically translates into a positive relation between the current account (with sign reversed) and growth. For U.S. states, we have approximate current accounts for 1953 and 1957 from Romans (1965), who painstakingly constructed estimates of saving and investment by state, but not for other years. However, past current account deficits will be reflected in current factor income payments (interest, dividends, and profits) and an outflow of factor income will lower income relative to output. Hence, we use the ratio of output to income as our proxy for past capital inflows. The output/income ratio will be larger than one for debtor states which have been recipients of capital (we re-scale it to be unity on average for each state) and smaller than one for creditor states who are receiving net capital income. Kalemli-Ozcan, Reshef, Sorensen, Yosha (2007) show the ratio of output to income for a region can be expected to increase by about 1/3 (one-third) the level of relative output growth in the previous period.[4]

A simple consequence of the above is that if all states start out at about the same level of output then the states that are subject to relatively large increases in productivity will become states that will be debtors and at the same time will have a relatively high level of output. In other words, we expect states and countries—if the phase of "catch-up growth" has come to an end—with relatively high output to be debtors.[5] In this article, we graphically verify the predictions that capital flows to high growth states or countries and we examine if U.S. states and European countries, respectively, appear to be past the "catch-up phase."

2.2 Results: U.S states

As in Kalemli-Ozcan, Reshef, Sorensen, and Yosha (2007), we use data from the Bureau of Economic Analysis (BEA). All nominal variables are converted into 2000 prices using the consumer price index. State-level GDP, denoted gross state product (GSP), is published by the BEA as part of the U.S. state-level national accounts. GSP is derived as the sum of value added originating in all industries in the state, thus, it is exactly the state-level equivalent of

[4]If the EU belonged to a fully integrated world market the ratio of output to income might increase by about a third times output growth but because we only want to examine the degree of integration among EU countries, we focus on relative output growth.

[5]Note that Kraay and Ventura (2000) develop a model where investment risk is high and not diversified. An implication of their model is that the current account response to a productivity shock should be equal to the savings generated by the shock multiplied by country's share of foreign assets in its savings portfolio. This implies that positive productivity shocks lead to deficits in debtor countries and surpluses in creditor countries.

GDP. GSP numbers are based on income generated in establishments and the main sources are industrial censuses such as the census of manufactures. GSP is available for the years 1977–2000. Previously published, but no longer updated by the BEA, GSP is available since 1963, but that data is not fully compatible with the data post 1977. Our main measure for income is state-level personal income (SPI), which is available from the BEA. SPI is based mainly on surveys of individual income.

The output/income ratio is our measure of the relative magnitude of net inter-state capital income flows to a state. If such flows are zero, the ratio is unity; if they are negative, the ratio exceeds unity; and if they are positive, the ratio is less than unity. The variables SPI and GSP contain aggregate (U.S.-wide) components. These aggregate effects are not of interest to us in the context of inter-state capital mobility. To correct for this, we use the normalized output/income ratio:

$$\text{Output/Income}_{it} \;=\; \frac{\text{GSP}_{it} \,/\, \text{SPI}_{it}}{\text{GSP}_{t} \,/\, \text{SPI}_{t}}\,,$$

where,

$$\text{SPI}_t \;=\; \Sigma_i \,\text{SPI}_{it}, \quad \text{GSP}_t \;=\; \Sigma_i \,\text{GSP}_{it}\,.$$

The ratio $\text{Output/Income}_{it}$ captures state i's output/income ratio in year t relative to the aggregate output/income ratio of the U.S. states.

The main reason for this methodology is the unavailability of the state level "current accounts." In Table 1, we display the 1953 and 1957 "current accounts" by state from Romans (1965). More precisely, we display saving minus investment for these years. Those numbers clearly show that saving minus investment was very large and negative for southern states as well as for oil states. It is clear that during this period capital was flowing from the North and west to oil-rich states such as Texas and Louisiana, as well as to states in the old South, such as Mississippi and Alabama, which were in the process of catching up. The states with large negative values of saving minus investment in the 1950s tend to be the states with high output/income ratios in the 1980s and 1990s.

We examine directly if the output/income ratio captures past "current accounts" by regressing the output/income ratio averaged over 1963–70 on the average of "current accounts" normalized by population for the years 1953 and 1957 (averaging may reduce measurement error). The results of this regression are displayed in the first column of Table 2 (see also

Kalemli-Ozcan, Reshef, Sorensen, and Yosha 2007). We find a highly significant value of the coefficient to the past "current account" with an R^2 of 0.51. Clearly, there is a strong relationship between the output/income ratio and the "current account" ten years earlier. In columns 2–4, we display the results for similar regressions for the decades of the 1970s, 1980s, and 1990s. We observe a decline in explanatory power as we consider more recent decades but the "current account" from the mid 1950s is still a significant determinant of the output/income ratio in the 1990s with an R^2 of 0.19.

Next we look at the predictions of the model. Figures 2–5 display the relation between the current account or output/income ratio in the late 20th century and previous period output and growth for the United States. As shown in Figures 2 and 3, throughout the sample period there is a positive relationship between capital flows and output growth, exactly as predicted by the model.[6] This shows that financial markets are well integrated within the United States.

Figure 4 demonstrates that in the early part of the century there is a negative relation between capital flows and income levels, whereas, as shown in Figure 5, in the latter part of the century this relationship turns to positive. Hence, there is evidence of "catch-up growth" by southern states in the early part of the century, with the "catch-up" phase being over in the latter part of the sample when capital starts flowing to high output states. The oil-states, Alaska (AK), Wyoming (WY), and Louisiana (LA) are clear outliers but even without them the pattern is visible. Barro and Sala-i-Martin (1991, 1992) documented that regional output levels (approximated by income levels) were converging in the early part of 1900s. They interpret convergence in the context of a one-sector model with frictions to the movement of (physical or human) capital; when these frictions are removed convergence follows. The results in Figure 4 are consistent with convergence and further document that flows of capital to the poorer southern regions were reinforcing productivity growth in the South. However, we also consider our results consistent with the alternative view of Caselli and Coleman (2001) discussed earlier. They rely on a more complicated two-sector model in order to highlight the underlying reasons for convergence, but their model may—for the

[6]Given that output data is not available before 1963, we use income instead on the X-axis for the pre-1960 period. We realize that this is contradictory to our key assumption in the model that with perfectly integrated markets output and income will differ. However, income is highly correlated with output as long as labor income is not diversified and, with no other option available to us, we use income to illustrate our point.

purpose of predicting the level and direction of capital flows—be approximated by a simple one-sector model as outlined in Figure 1.

How do European countries fit to this picture? This is the question that we are going to investigate next.

2.3 Results: EU countries

Figures 6–11 show that EU countries are still in the "catch-up growth" phase. We investigate the 1970s, 1980s, and 1990s separately and plot the average current account balances during these decades against output growth. We reverse the sign of the current accounts because we focus our discussion on capital inflows. Figures 6, 7, and 8 reveal a positive relation between growth and capital flows as the simple neoclassical model would suggest. A close look reveals that there is no relationship between growth and capital flows in the 1970s without Ireland, which shows that Europe was not well integrated in our sense. In the 1980s and 1990s financial integration increased and capital started flowing to high growth countries.

Figures 9, 10, and 11 reveal a negative relationship between the output level and capital flows with little change over time. This evidence suggests that the EU countries are still in the "catch-up" phase.[7] Blanchard and Giavazzi (2002) consider the current account deficit of Portugal which in 2001 reached 10% of GDP, up from 2% at the start of the 1990s. Greece is not far behind with a deficit of 7% of GDP, up from 1% in the early 1990s. This is not the first time that small member countries of the European Union run large current account deficits. In the early 1980s, Portugal ran deficits of a different kind. Portugal then was still reeling from its 1975 revolution, from the loss of its colonies, and from the second oil shock and the government was running a large budget deficit. These deficits turned out to be unsustainable: Between 1980 and 1987, the escudo was devalued by 60% and the current account deficit was eliminated. In contrast, Portugal today is not suffering from large adverse shocks; the official budget deficit has been reduced since the early 1990s. The fact that Portugal and Greece are each members of both the European Union and the Euro area, and, in each case, the poorest

[7] We do not expect the model to fit perfectly at the country level because of its simplicity. For example, the assumption of a constant saving rate may be particularly heroic for countries which have, more or less, independent fiscal policies. Also, a country such as the Netherlands may have relatively high growth and high saving due to an aging population. We here focus only on the "big picture" and do not attempt to reach a model with a better fit.

members, suggests a natural explanation for these current account deficits. The deficits are exactly what theory suggests can and should happen when countries become more closely linked in goods and financial markets. If relatively poor countries have higher rates of return to capital, poor countries should see an increase in investment. If they further have high growth prospects, they should also see a decrease in saving according to permanent income theory. Thus, on both counts, poor countries should run larger current account deficits. Symmetrically, richer countries should run larger current account surpluses. Blanchard and Giavazzi (2002) conclude that integration affects current account balances and the Feldstein-Horioka puzzle does not exist in Europe anymore.

Abiad, Leigh, and Mody (2007) similarly show that, unlike the global sample, in Europe capital flows "downhill" and capital flows have accelerated with increased financial integration and supported income convergence. They argue that Europe is the best place to test the relationship between financial integration and income convergence since the extent of financial integration within Europe is greater than in any other significant geographical region. They find a substantial flow of foreign capital from advanced countries to the new EU member countries of Central and Eastern Europe. Caselli and Tenreyro (2005) revisit Western Europe's record of labor-productivity convergence. They find that the poorer Western European countries caught up with the richer ones through both higher rates of physical capital accumulation and greater total factor productivity gains. These (relatively) high rates of capital accumulation and TFP growth reflect convergence along two margins. One margin (between industries) is a massive reallocation of labor from agriculture to manufacturing and services, which have higher capital intensity and use resources more efficiently. The other margin (within industries) reflects capital deepening and technology catch-up at the industry level.

Ekinci, Kalemli-Ozcan, and Sorensen (2007) investigate EU regions with a focus on capital flows between regions within countries. They find large net capital flows to high productivity regions within countries of northern Europe, whereas there is weak evidence for regions of southern Europe. They also find that European countries are far from fully integrated in the sense of both equal returns to capital and perfectly diversified ownership.

3 Capital flows and institutions

3.1 Countries

In this section, we provide simple suggestive evidence that institutions broadly defined are important determinants of capital flows. First we estimate an index that shows the degree of capital market integration. The index will be based on the responsiveness of capital income flows to productivity growth and derived from the model that is described in section 2.1. Specifically, we examine whether the *change* of the output/income ratio is positive for regions with high growth using regression methods. As discussed before, intuitively, if capital ownership is fully diversified, the capital in a region will mainly be owned by non-residents. Assuming that the income share of capital is 0.33, a relative increase in growth should be associated with an increase in the ratio of output to income of about one-third the relative change in growth because a fraction 0.33 of the growth in output is generating capital income which is diffused over the whole EU.[8] Thus we interpret the slope coefficient from the regression of the *change* in the output/income ratio on regional growth as the *de-facto* measure of financial integration.

The regression takes the form

$$\Delta(\text{OUTPUT}/\text{INCOME})_i \;=\; \mu + \alpha\,\Delta \log \text{GDP}_i \;+\; e_i,$$

where $\Delta(\text{OUTPUT}/\text{INCOME})_i = (\text{OUTPUT}/\text{INCOME})_{i,2003} - (\text{OUTPUT}/\text{INCOME})_{i,1996}$ and $\Delta \log \text{GDP}_i = \log \text{GDP}_{i,1994} - \log \text{GDP}_{i,1991}$. The sample for growth and for the output/income ratio are non-overlapping to prevent measurement errors in output to enter on both sides of the equality sign because that would create a spurious correlation between the left- and right-hand sides. GDP growth on the right-hand side is per capita and averaged over three years in order to minimize the impact of short term fluctuations. The change in the output/income ratio is calculated for 7 years, rather than 1, in order to capture "medium run" changes. The regression estimate of α is equivalent to the slopes of the fitted lines in Figures 6–8 for the most recent sample we have available.

In Figure 12, we plot this capital flows-productivity index; i.e., the estimated value of α

[8] Full derivation of this result is shown in Kalemli-Ozcan, Reshef, Sorensen, and Yosha (2007).

against the cost of entry from Djankov et al. (2002). There is a negative relationship between the two, indicating capital does not fully flow to from less productive to more productive countries within the EU if the countries involved have high business entry costs. Figure 13 plots the same measure against an index of property rights from International Country Risk Guide (ICRG) and it is evident that among the productive countries the ones with more investor rights and less corruption will receive more capital flows. Figures 12 and 13 suggest that financially integrated countries with good institutions obtain more flows than countries with worse institutions when hit by positive productivity shocks.

As noted above, Ekinci, Kalemli-Ozcan, and Sorensen (2007) find that large net capital flows to high productivity regions within countries of northern Europe, whereas there is weak evidence for regions of southern Europe. The differences in the findings for the northern and southern regions within countries are correlated with variables such as expropriation risk, government stability, and law and order. However, these variables do not fully explain the differences. In Italy and Spain, net income flows appear to be influenced significantly by patterns of government taxes and transfers. Ekinci, Kalemli-Ozcan, and Sorensen (2007) also find regions with high confidence and trust have the level of financial integration that is consistent with full integration.

4 Conclusion

Capital flows to regions where its marginal product is highest. When long-standing barriers to capital flows are removed capital flows to relatively poor regions during a "catch-up growth" phase and when this phase is over flows to regions with high productivity. Barriers to capital flows within the United States disappeared in the mid-20th century and for a period of time capital flowed from the wealthy northern states to poorer states in the old Confederacy. Today, U.S. states are past the "catch-up" phase and capital flows to states with positive productivity shocks—which tend to also be high output states. EU countries still appears to be in the "catch-up" growth phase: Within-EU capital flows to poor but fast growing countries such as Greece and Portugal.

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Table 1: **State "Current Accounts" from Romans**

	S–I in 1953 per capita	S–I in 1957 per capita	S–I in 1953 millions	S–I in 1957 millions
Alabama	–114	–629	–54	–319
Alaska	.	.	.	.
Arizona	–1226	–654	–170	–120
Arkansas	–576	–559	–159	–158
California	648	876	1231	2039
Colorado	216	–195	48	–53
Connecticut	1229	946	413	364
Delaware	2058	3970	112	276
Florida	542	956	278	682
Georgia	–29	–259	–16	–159
Hawaii	.	.	.	.
Idaho	–963	–754	–89	–79
Illinois	623	–19	876	–30
Indiana	–473	–1398	–307	–1033
Iowa	819	–68	334	–30
Kansas	–116	–688	–36	–239
Kentucky	–404	–280	–182	–134
Louisiana	–1316	–1472	–585	–748
Maine	247	247	35	38
Maryland	543	154	216	72
Massachusetts	982	1401	732	1127
Michigan	88	–342	93	–422
Minnesota	503	318	238	170
Mississippi	–110	–807	–36	–275
Missouri	847	502	528	343
Montana	–754	–533	–72	–58
Nebraska	778	–519	159	–118

State "Current Accounts" from Romans—continued

	S–I in 1953 per capita	S–I in 1957 per capita	S–I in 1953 millions	S–I in 1957 millions
Nevada	–595	–118	–18	–5
New Hampshire	1309	557	111	52
New Jersey	486	521	394	488
New Mexico	–1655	–1064	–194	–147
New York	1461	1790	3517	4783
North Carolina	–133	–205	–85	–146
North Dakota	–1292	–781	–122	–78
Ohio	–869	–531	–1157	–815
Oklahoma	30	–508	10	–189
Oregon	–48	–408	–12	–114
Pennsylvania	79	620	131	1109
Rhode Island	681	1195	86	166
South Carolina	–192	–447	–65	–166
South Dakota	149	–230	15	–25
Tennessee	–328	–275	–169	–154
Texas	–580	–1246	–750	–1844
Utah	–175	–1039	–20	–140
Vermont	408	130	24	8
Virginia	–63	–99	–35	–62
Washington	–173	–664	–66	–295
West Virginia	–909	–1470	–272	–442
Wisconsin	324	–42	176	–26
Wyoming	–1357	–1756	–61	–90

Notes: These data is from Romans (1965). "S−I" is the difference between state-level saving and state-level investment for the given years. All series are in 2000 prices. Romans' total investment estimates for each state are calculated by aggregating investment in manufacturing, mining, railroads, other transportation, public utilities, communications, agriculture, and construction. He uses annual surveys for some industries and balance sheets of companies (railways, utilities,etc.) for others. For industries where neither is available, he imputes from aggregate investment figures utilizing state-level wages and salaries for that particular industry. His saving estimates are based on state-level data, when available, on currency and bank deposits, saving and loan shares, private insurance and pension reserves, consumer debt, securities loans, mortgages, and bank debt, and involves a large number of imputations.

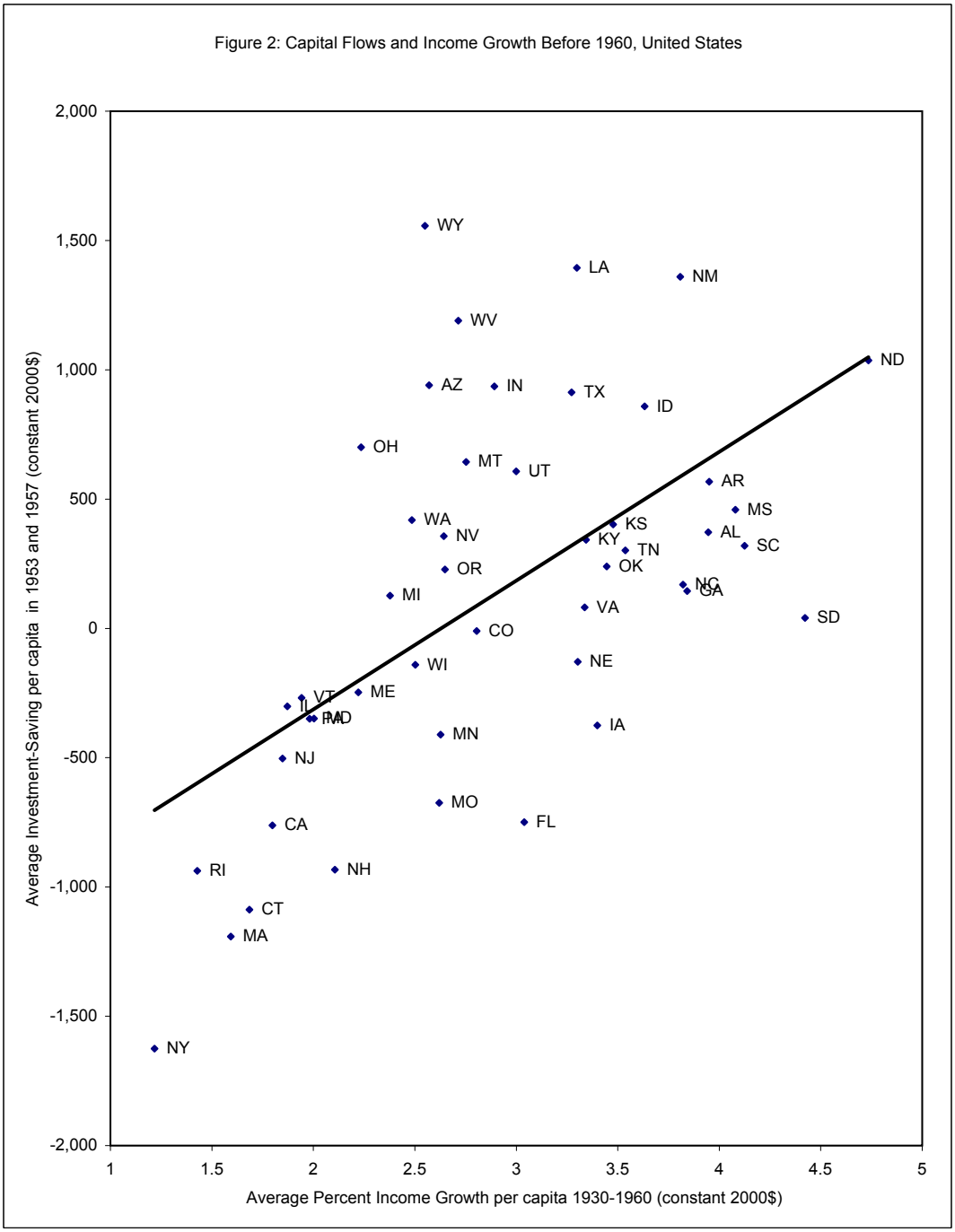
Table 2: **State "Current Accounts" and Net Capital Income**

Dependent Variable: Log of Average Output/Income

	(1)	(2)	(3)	(4)
Sample	1963−1970	1971−1980	1981−1990	1991−2000
States	47	47	47	47
Average Saving minus Investment per capita 1953−1957	–0.09 (5.04)	–0.10 (4.30)	–0.08 (2.54)	–0.04 (2.32)
R^2	0.51	0.50	0.29	0.19

Source: Kalemli-Ozcan, Reshef, Sorensen, and Yosha (2007).
Notes: 47 observations (missing data for Alaska and Hawaii; the outlier Delaware is left out). Average Output/Income is output divided by income (and normalized by U.S. output/income), where output is Gross State Product (GSP) and income is State Personal Income (SPI), averaged over the relevant sample, given in "Sample". Average Saving minus Investment per capita 1953−1957 is the difference between state-level saving and state-level investment per capita, averaged for the two years for which this data is available, 1953 and 1957. State-level investment and state-level saving are from Romans (1965) and used in thousands of dollars in 2000 prices in the above regressions. See table 1 for the detailed explanations of state-level investment and saving estimates. A constant is included in all specifications. Heteroskedasticity robust t-statistics in parentheses.

Figure 2: Capital Flows and Income Growth Before 1960, United States



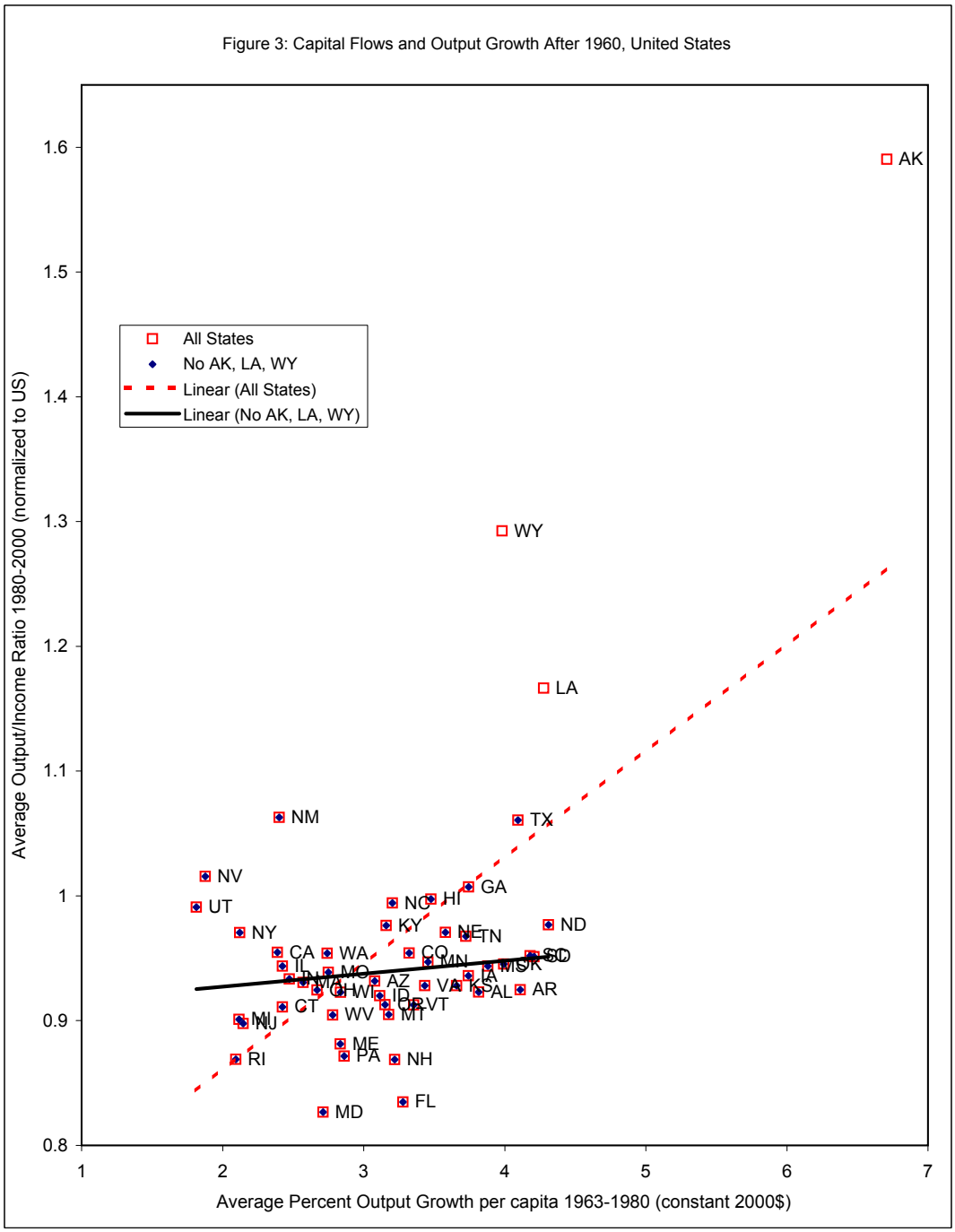


Figure 3: Capital Flows and Output Growth After 1960, United States
Average Output/Income Ratio 1980-2000 (normalized to US)
Average Percent Output Growth per capita 1963-1980 (constant 2000$)
All States
No AK, LA, WY
Linear (All States)
Linear (No AK, LA, WY)
AK
WY
LA
NM
TX
NV
UT
NY
GA
HI
NC
KY
ND
TN
CA
WA
CO
MN
AZ
VA
AR
CT
WV
MT
ME
RI
PA
NH
MD
FL
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
1
2
3
4
5
6
7

Figure 4: Capital Flows and Income Before 1960, United States

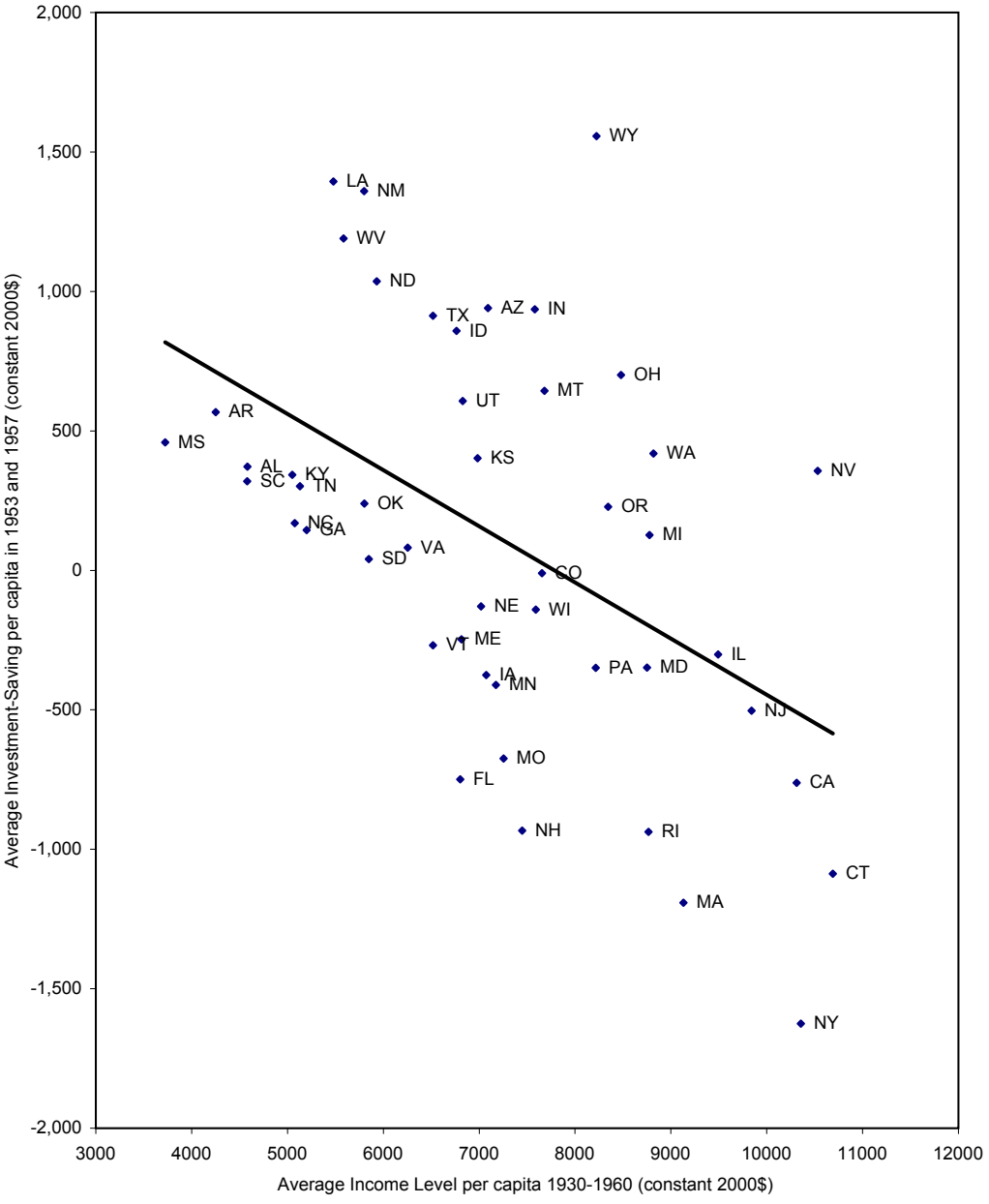


Figure 5: Capital Flows and Output After 1960, United States

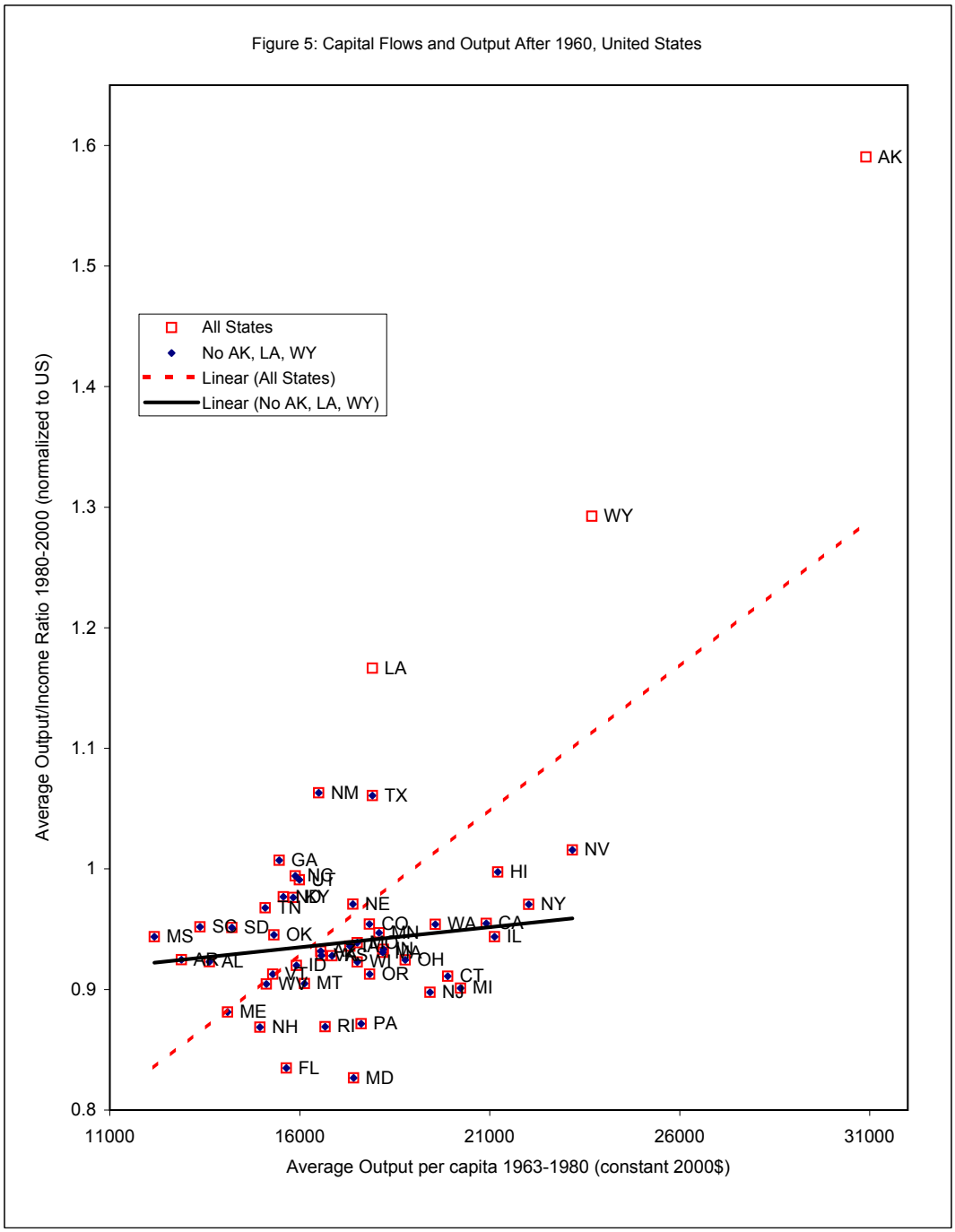


Figure 6: Capital Flows and Output Growth in 1970s, European Union

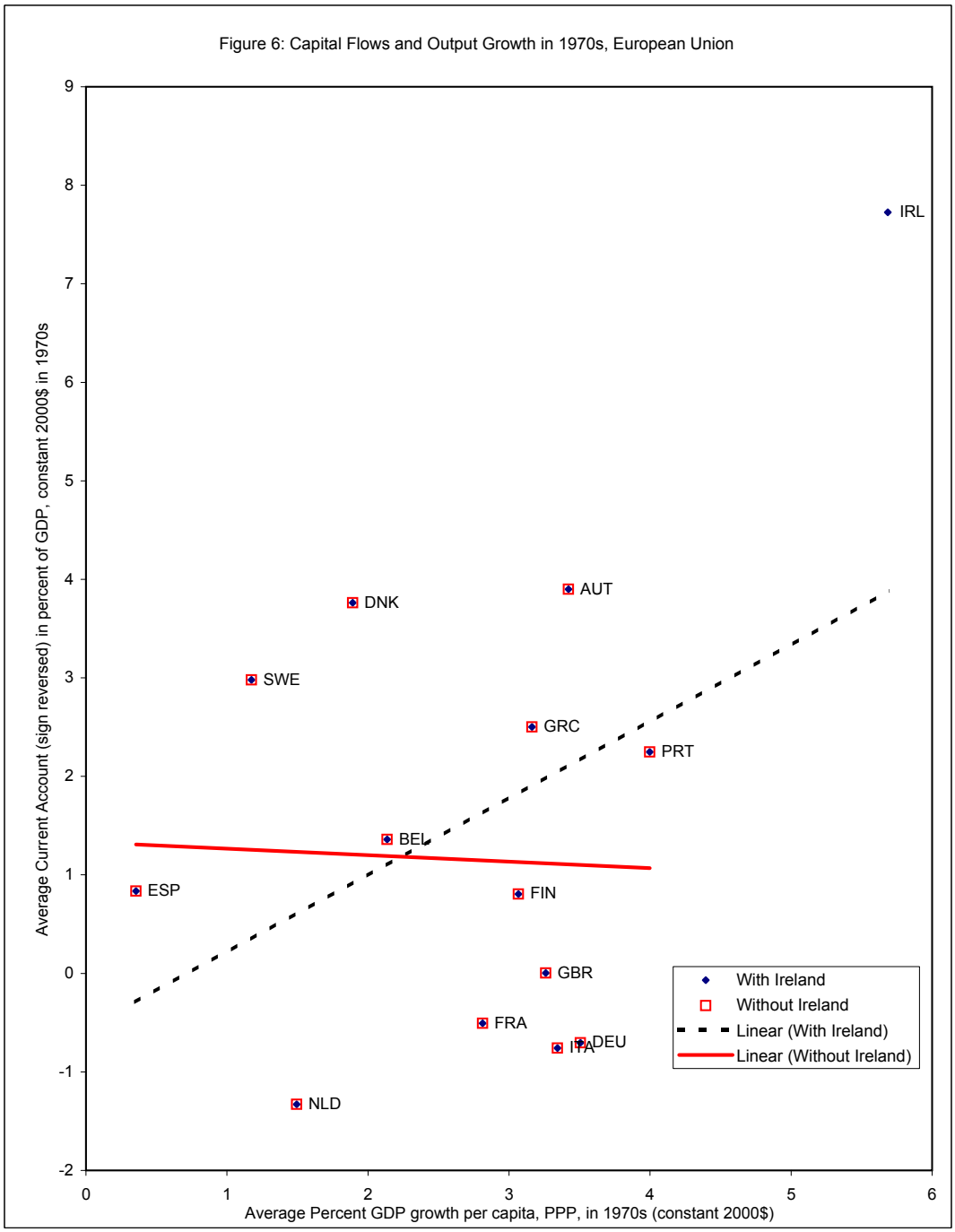


Figure 7: Capital Flows and Output Growth in 1980s, European Union

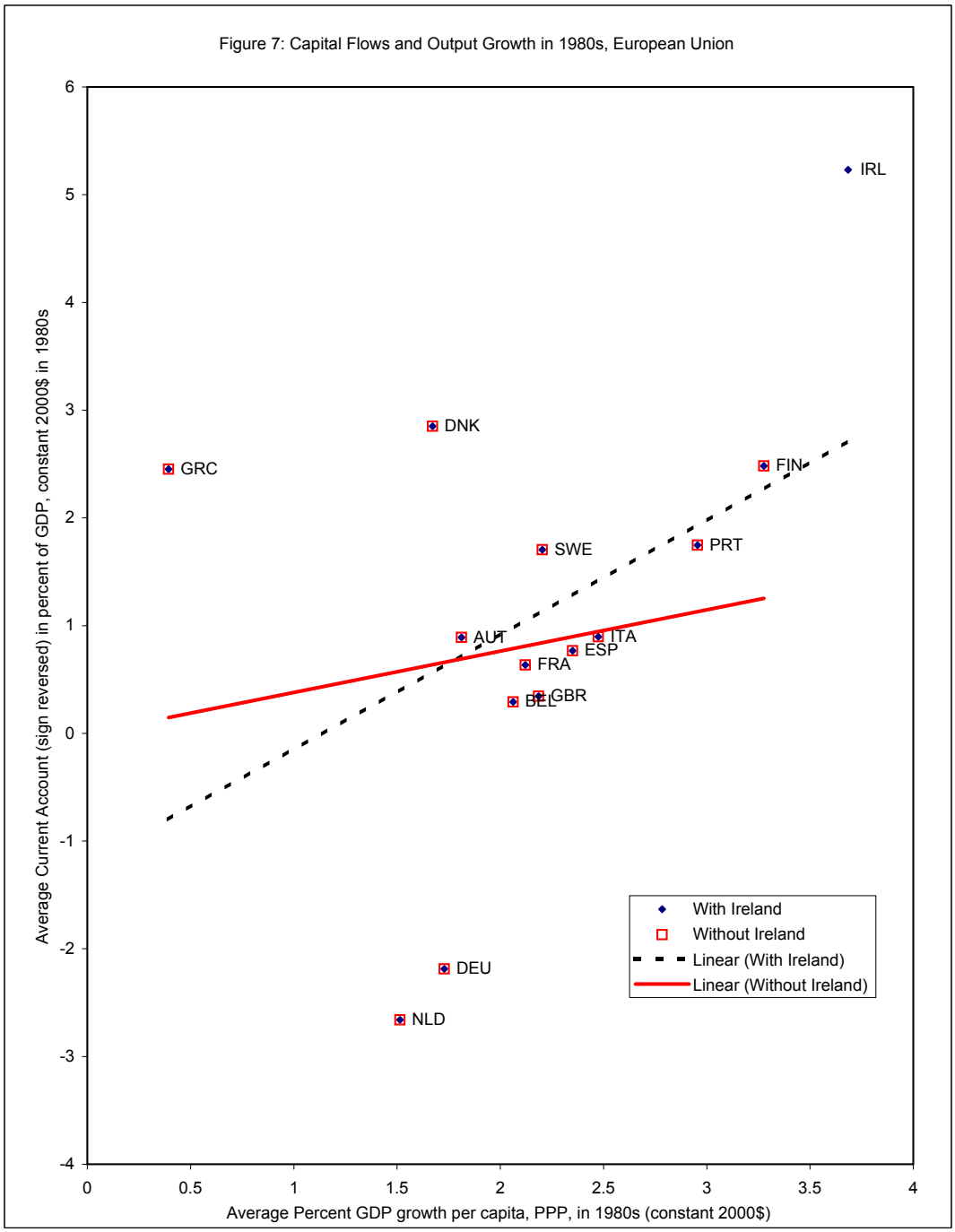


Figure 8: Capital Flows and Output Growth in 1990s, European Union

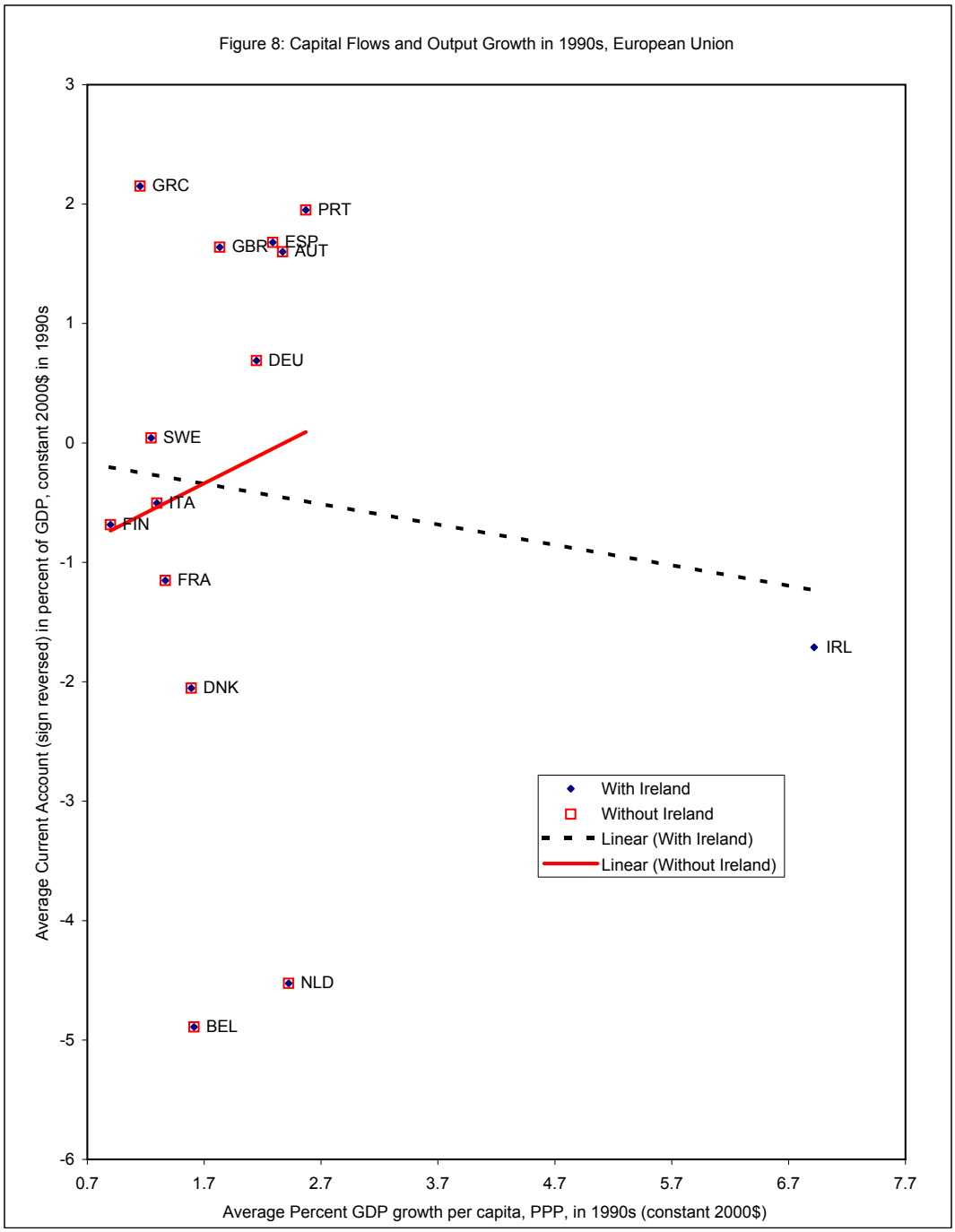


Figure 9: Capital Flows and Output in 1970s, European Union

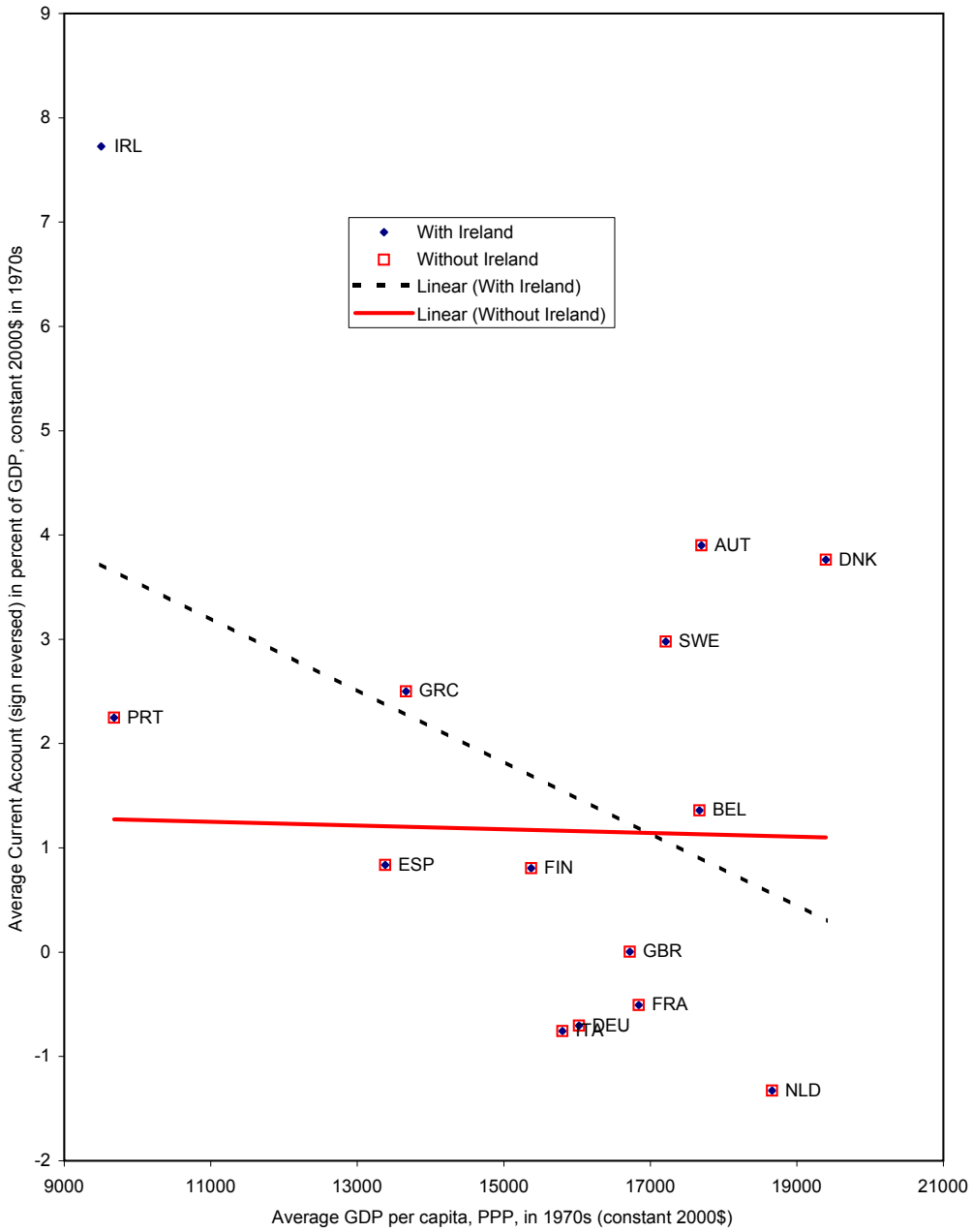


Figure 10: Capital Flows and Output in 1980s, European Union

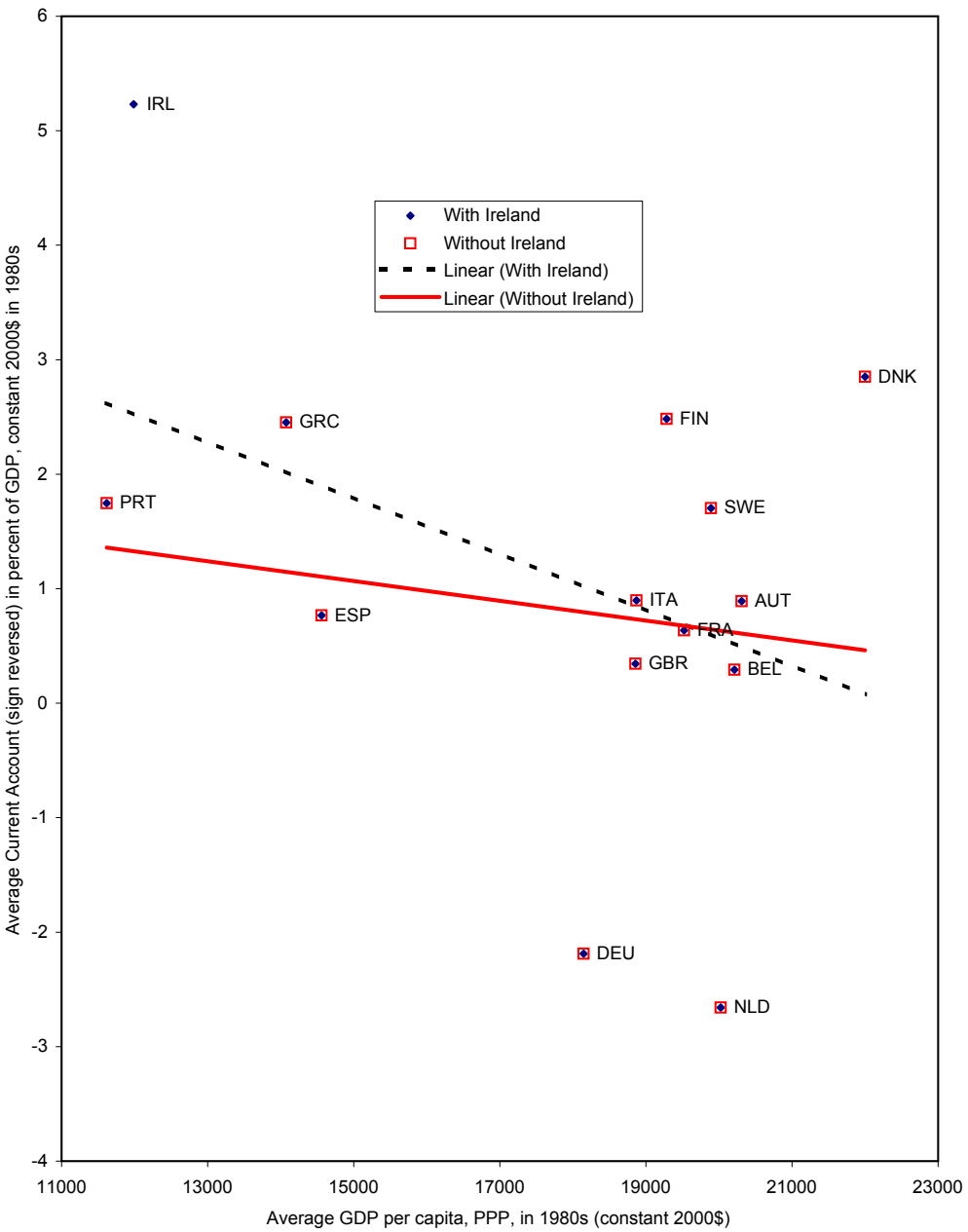


Figure 11: Capital Flows and Output in 1990s, European Union

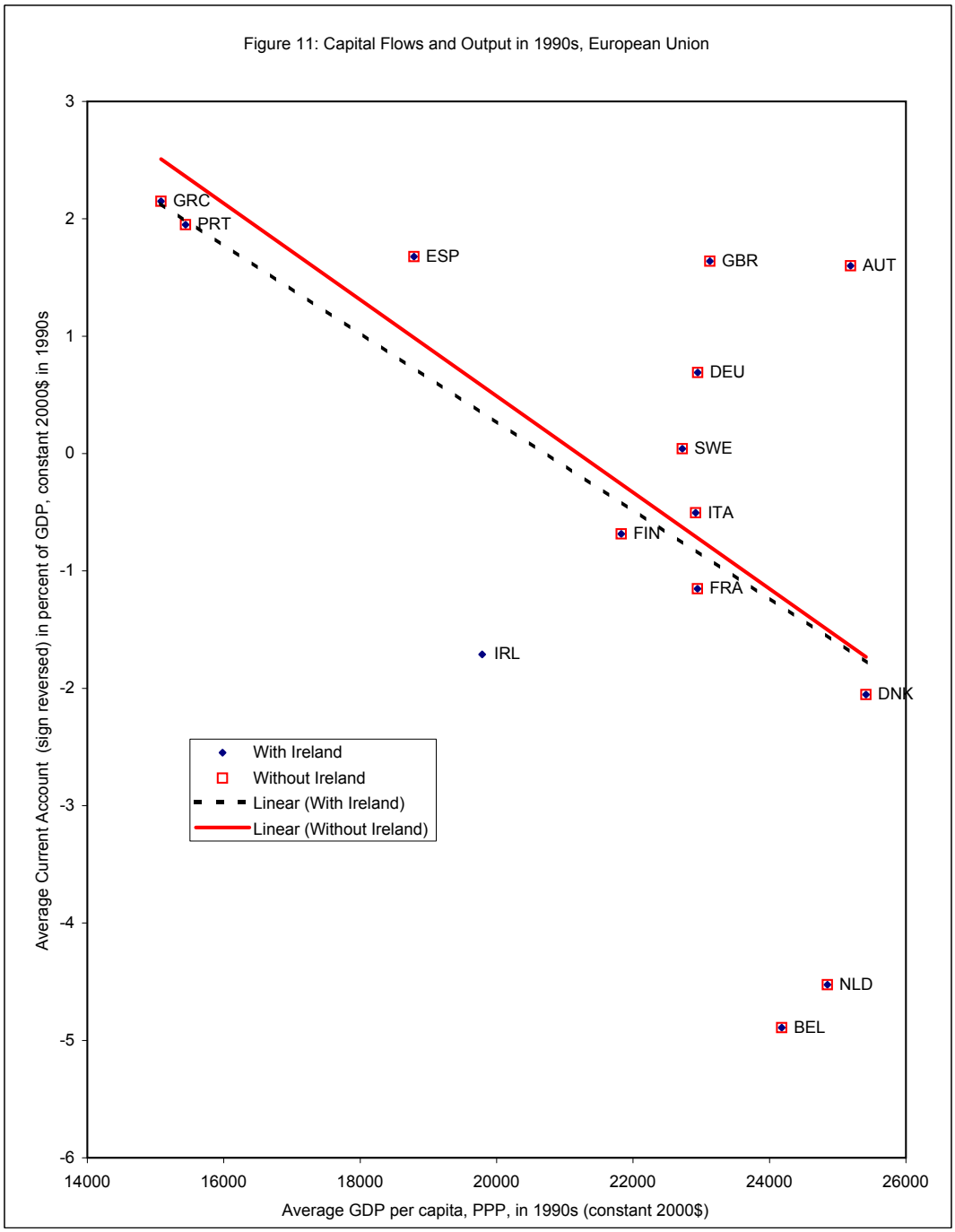


Figure 12: Capital Flows and Entry Cost

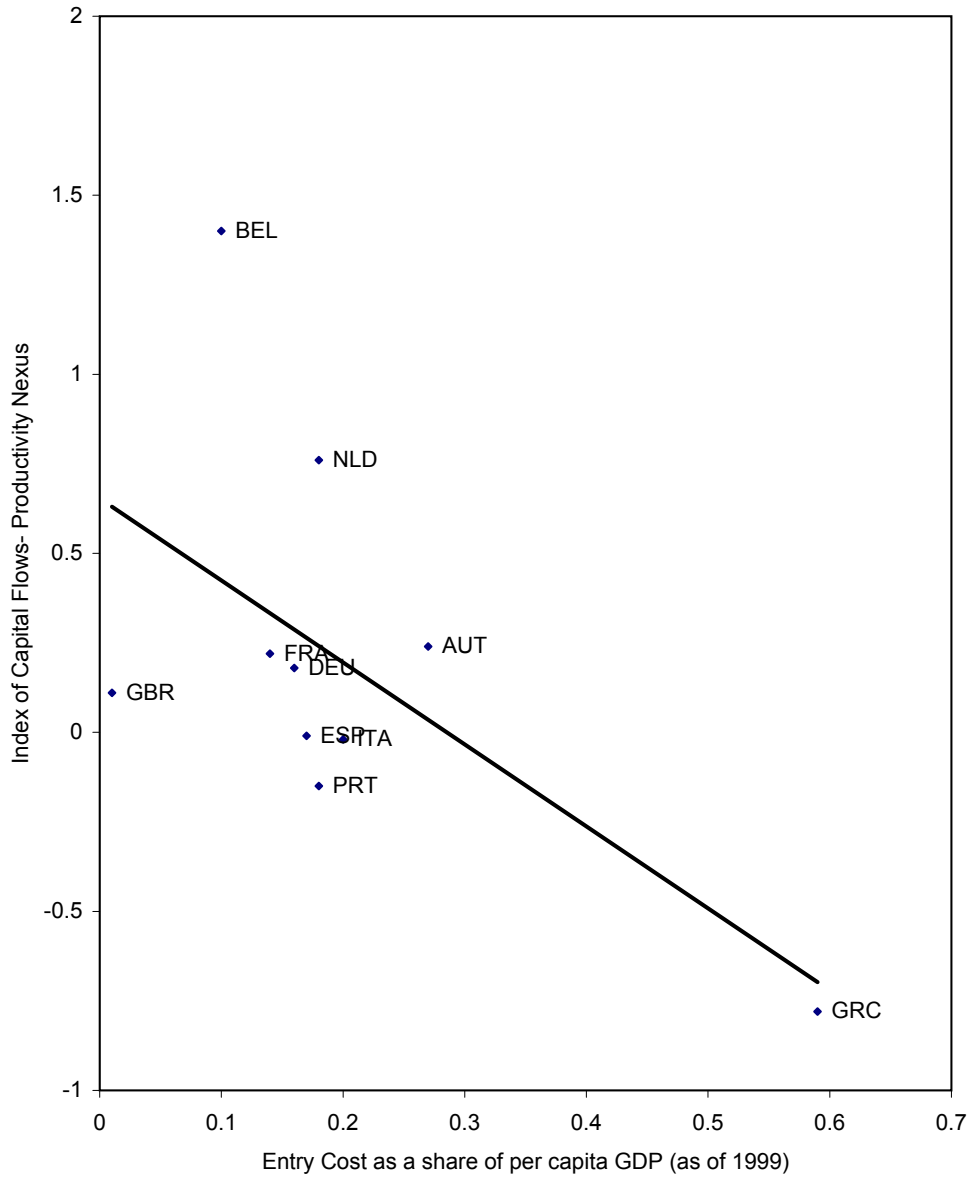


Figure 13: Capital Flows and Investor Rights