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Mehmet Fatih Ekinci
Sebnem Kalemli-Ozcan
Bent Sorensen

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ABSTRACT

We investigate the degree of financial integration within and between European countries. We construct two measures of de-facto integration across European regions to capture "diversification" and "development" finance in the language of Obstfeld and Taylor (2004). We find evidence that capital market integration within the EU is less than what is implied by theoretical benchmarks and also less than what is found for U.S. states. We ask - why is this the case? Using country-level data for economic institutions, we find that these are not able to explain differences between countries. Using regional data from the World Values Surveys, we investigate the effect of "social capital" on financial integration among European regions. We find regions, where the level of confidence and trust is high, are more financially integrated with each other.

Mehmet Fatih Ekinci
Department of Economics
University of Rochester
Harkness Hall
Rochester, NY 14627
mekinci@troi.cc.rochester.edu

Bent Sorensen
Department of Economics
University of Houston
204 McElhinney Hall
Houston, TX 77204
bent.sorensen@mail.uh.edu

Sebnem Kalemli-Ozcan
University of Houston
Department of Economics
Houston, TX 77204
and NBER
sebnem.kalemli-ozcan@mail.uh.edu

1 Introduction

Financial markets are becoming more integrated as countries lower barriers to trading in financial assets such as stocks and bonds. Such integration will tend to equate expected returns to investing in different countries but the ownership of physical capital in a country may still be mainly in the hand of domestic residents. In this paper, we investigate the degree of financial integration within Europe using a measure suggested by Kalemli-Ozcan, Reshef, Sørensen, and Yosha (2007), who find that ownership of physical capital among the 50 U.S. states is almost perfectly diversified across the entire United States.[1]

We find little evidence of capital market integration— defined as diversification of ownership of physical capital—*between* EU countries, except for Ireland. Our main focus is to examine if regions *within* EU countries are integrated. We find stronger evidence of capital market integration for EU regions within countries. However, the amount of this integration is still less than what is implied by a simple benchmark model with fully diversified ownership of physical capital. We examine if the degree of capital market integration depends on "social capital" proxied by confidence and trust and we discover that regions where the level of confidence and trust is high are more financially integrated with each other.

Standard neoclassical models predict that capital will move to regions where the marginal product of capital is higher. Within a fully integrated capital market with no "frictions" this implies that capital will flow to regions with the highest 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 total factor productivity (TFP). In reality, the actual return may deviate from the marginal product of capital for numerous reasons. Risk-adjusted returns to investment may not be as high as suggested by low capital-labor ratios. Countries with low capital-labor ratios might receive less foreign investment than implied by benchmark models

[1]Cross-ownership across states can take the form of direct ownership through stocks but in most cases cross-ownership is indirect through financial intermediaries and through corporations with branches in many states. We have not explored channels of ownership but in the United States direct stock holdings appear to be too small to explain near-perfect diversification.

due to their low productivity. Recent research show a positive relation between capital flows and various determinants of productivity, such as property rights (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 shown by Kraay and Ventura (2000) low productivity countries' implied risk premiums on foreign investment are quite high. Current productivity depends on the broader institutional framework which is a function of the historical past of countries as shown by Acemoglu, Johnson, and Robinson (2001). Hence, history may influence current financial performance through institutions. In the EU, laws and institutions are intended to secure the free flow of capital; however, these *de-jure* laws may only be a part of investor protection *de-facto*.

Our goal here is to examine EU regions within EU countries, a similar setting to U.S. states, where the conditions of the basic neoclassical model with diversified ownership are likely to hold. We also consider EU countries although it is well known that net flows at the country level are small and country assets are not well diversified.[2] La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) show that countries with different historical legal traditions differ in financial performance. This may affect the level of within-country capital market integration. However, we find little evidence that country level institutions matter for intercountry capital market integration. Maybe institutional differences are too minor too matter in the EU or maybe formal institutions function differently in different cultural environments.[3]

Why may identical institutions in different societies have different impacts? Regions within countries often differ in the levels of "social capital" even if laws and formal institutions are identical. People will likely to invest less if they trust each other less and have no confidence in institutions; i.e., when the level of "social capital" is low. Hence, in this

[2]For a recent treatment of these issues see Obstfeld and Taylor (2004) and Sørensen, Wu, Yosha, and Zhu (2007) respectively. The phenomenon of no-diversification is often refereed as"home bias" and was first documented by French and Poterba (1991). Home bias has declined significantly in the last decade but important deviations from full diversification still exist.

[3]There is two-way causality between culture and institutions as argued by Inglehart (2000). Thus, Fernandez (2007) argues that, work that attempts to undercover whether institutions or culture is the most important determinant of economic development may not be fruitful.

paper we proxy "social capital" with trust and confidence. Specifically, our "trust" variable is measured as whether respondents in the World Values Survey agree with the statements "most people can be trusted" and "I trust other people in the country" and our "confidence" variable is measured as whether the respondents agree to have confidence in the courts, the parliament, and other institutions.[4]

We display in Figure 1 and Figure 2 the relative (to the country average) degree of trust and confidence, respectively, in the EU countries for which the data are available. In the figures, the darker the color, the higher the level of trust or confidence. There are systematic differences within countries, for example, Scotland displays high trust and confidence and the level of trust is higher in northern than in southern Germany while the level of confidence is higher in western than in eastern Germany. Early studies by political scientists on the effects of "social capital" were inspired by the differences in the levels of trust in northern versus southern Italy. This pattern be readily seen from Figure 1.[5] Motivated by the early findings for Italy and the regional variation in the endowments of social capital across Europe, Tabellini (2005) investigates the effect of culture (measured as trust and confidence) on per capita output levels of European regions controlling for country effects. He aggregates to the regional level the individual responses collected in the opinion polls of the World Values Survey in the 1990s (Inglehart, 2000). In this paper, we attempt to explain the differences in financial integration among European regions rather than the output differences studied by Tabellini.[6]

Our regional dataset is ideal for examining *de-facto* versus *de-jure* financial integration within Europe since we can exploit variation among European regions and control for national legal systems and institutions. We investigate the effect of trust and confidence on

[4]See data appendix for the exact definitions.

[5]See Banfield (1958) and Putnam (1993) who have argued that the differences in social and economic behavior between northern and southern Italy can be traced back to their distant histories and traditions, and that these different endowments of "social capital" in turn contribute to explain the economic backwardness of southern Italy.

[6]Beugelsdijk and von Schaik (2001) and Knack and Keefer (1997) perform an analysis similar to that of Tabellini for European regions studying the correlation between indicators of social capital and per capita output.

Figure 1: Trust within EU

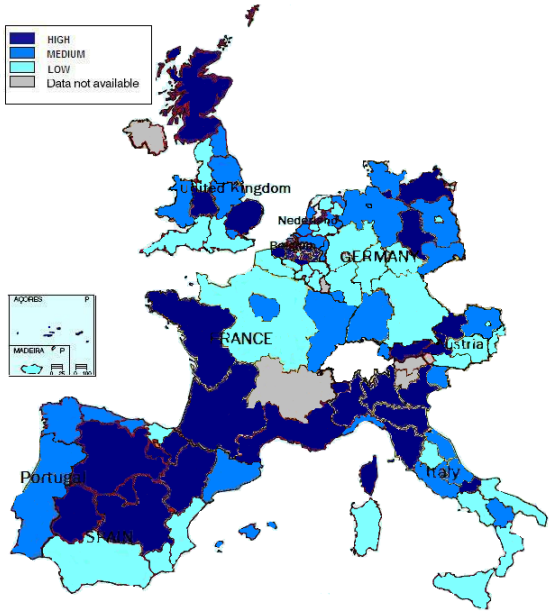
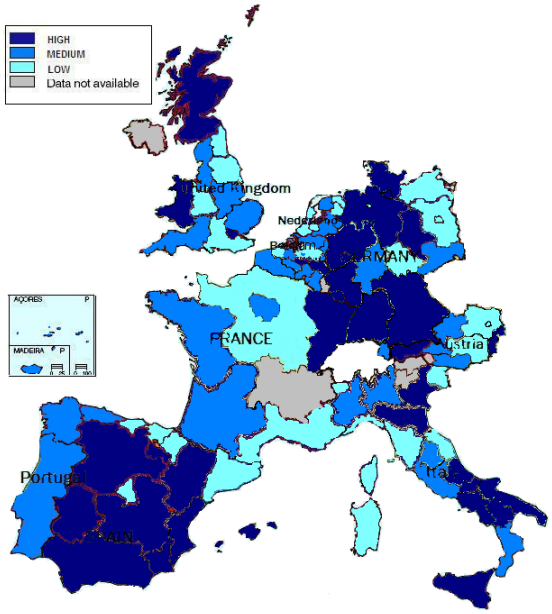


Figure 2: Confidence within EU



financial integration among the European regions controlling for country level effects. In correspondence with the dictum that "culture matters," we find that regions with high levels of confidence and trust are more financially integrated with similar regions within the same country.[7]

Recently, there has been extensive research effort put into answering the question, "do differences in beliefs and preferences vary systematically across groups of individuals over time and do these differences explain differences in outcomes?"[8] In some cultures banks are not trusted and cash (or precious metals) is the only accepted store of value. Such savings vehicles are not optimal for financial intermediation and, thus, capital market integration. Financial contracts are typically trust-intensive—even if a wronged party can rely on the courts this may be too expensive in terms of money and time to be worthwhile. Therefore, social capital may have major effects on financial development. Guiso et al. (2004a) study the effects of social capital on domestic financial development using household data from Italy and find that individuals with high social capital in Italy make different financial choices than individuals with low social capital in the use of checks or portfolio allocation. They argue that, for financial exchange, not only legal enforceability of contracts matters but also the extent to which the financier trusts the financee.[9] Guiso et al. (2004b) investigate the relationship between trust and trade and portfolio investment in a bilateral country setting. Since more trade increases growth which in turn will raise trust, they use exogenous variation in trust proxied by common language, border, legal system, and genetic-ethnic

[7]The phrase "culture matters" was first popularized by Landes (1998). We use the terms social capital and culture as synonyms in this paper and assume trust and confidence are important determinants of both. Fukuyama (2002) argues that there is no agreement on what social capital is. He defines it as cooperation among people for common ends on the basis of shared informal norms and values. Hence social capital is a utilitarian way of looking at culture. He also argues that in some forms social capital can be destructive to development if it creates family networks that are resistant to change and involves mistrust of strangers as in Latin America (as also argued by Banfield for Italy). In Fukuyama's words: "It is not sufficient to go into a village, note the existence of networks, label it social capital, and pronounce it a good thing." A detailed analysis of social capital is beyond the scope of this paper. However, we emphasize that the questions on which we base our measures of social capital involves confidence and trust in collective institutions such as the EU rather than confidence and trust in narrow networks such as families.

[8]See Fernandez (2007) and Guiso et al. (2006) for excellent surveys on this topic.

[9]They measure regional social capital by electoral participation and by the frequency with which people in a region donate blood.

distance between two countries' populations. They find that a country that trust another country less, trade less with and invest less in that county. Others have looked at the effect of culture on various individual decisions such as fertility and labor supply.[10]

Greif (1994) stresses the interaction between culture and institutions and describes how the different cultures of Maghribi traders (who set up horizontal relations where merchants served as agents for traders) and Genoese traders (who set up a vertical relation where individuals specialized as merchants) in the late medieval period led them to develop different institutions, and how this mattered for their subsequent development paths.[11] Providing causal evidence of the influence of culture on development turns out to be the key issue in this literature.[12] At the country level it is hard to identify causal effects because differences in beliefs may be the consequence of different economic and institutional environments. Also, as argued by Inglehart (2000), culture is endogenous to development and changes over time as a result of "modernization."[13]

Financial integration may take two forms. Agents and regions may use financial markets 1) to diversify risk or 2) to invest net capital in highly productive regions. This process has been referred to as "diversification versus development finance" by Obstfeld and Taylor (2004). We propose two metrics for measuring diversification and development finance both of which are based on the net capital *income* flows between regions. In the country-level national accounts net capital income flows are approximately equal to the difference between Gross National Income ("income") and Gross Domestic Product ("output").[14] GDP

[10]See Fernandez et al. (2002, 2004), Fernandez (2007), and Glaeser et al. (2000).

[11]Zak and Knack (2001) investigate the relation between trust and growth in a cross-country setting while La Porta et al. (1997) investigate the effect of trust in the working of large organizations. Fukuyama (2002) argues that one of the reasons why the "Washington Consensus" to development of transitional economies failed in 1990s was because it fails to incorporate the role of social capital.

[12]Fernandez (2007) points out that the usual practice of exploiting religious composition of a country as the source of exogenous variation may be problematic since it may explain the aggregate outcome through other channels than directly through social capital.

[13]Another problem is measuring the change in culture. As argued by Fukuyama (2002), even the most ambitious study of social capital by Putnam (2000) cannot convincingly identify the sign of the change in social capital in the United States over the last 40 years. Inglehart (2000) argues that some cultural values are very persistent in spite of modernization and some may not change at all. He concludes that modernization theory is probabilistic and not deterministic.

[14]In the country-level national accounts, the difference between GDP and Gross National Income is net

is observed for European regions but the region-level equivalent of GNI is not. We use approximations to regional-level GNI based on observed regional personal income and the ratio of GDP to GNI ("output/income") is then an indicator of net capital income.[15]

We estimate two sets of regressions using data from 168 NUTS2 level regions and, due to lack of data for some variables, 105 regions composed of NUTS1 and NUTS2 regions as a mixed sample.[16] The first set of regressions examine whether the *change* of the output/income ratio is positive for regions with high growth. Intuitively, if capital ownership is fully diversified, the capital in a region will mainly be owned by non-residents. Assuming that the income share to capital is 0.33, a relative increase in growth should be associated with a increase in the ratio of output to income of about one third times 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 country.[17] 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; i.e., a measure of diversification finance.

If capital flows to high growth regions we should, everything else equal, see that high output regions run current account deficits and hold negative net asset positions.[18] On the other hand, poorer regions might become competitive due do "recent" changes in technology or human capital accumulation and "catch-up growth" may be observed where low output

factor income which includes net foreign income to capital and net earnings of domestic *residents* (not citizens) abroad. However, foreign earnings of domestic residents are usually fairly small compared to capital income.

[15]In the national accounts, personal income can be found (approximately) from Gross National Income by subtracting corporate profits and net personal interest payments and adding transfers. Subtracting personal taxes gives *disposable personal income*. In the present paper we have data for regional income that does not include transfers, making it closer to Gross National Income—see the appendix for a more precise description of our data.

[16]NUTS refers to Nomenclature of Territorial Units for Statistics.

[17]This result is derived in more detail in Section 2.

[18]Kraay and Ventura (2002) develop a model where investment risk is high and diminishing returns are weak. The implication of their model is such that current account response should be equal to the savings generated by the positive productivity shock multiplied by country's share of foreign assets in total assets. This implies that positive productivity shocks lead to deficits in debtor countries and surpluses in creditor countries. Our model is consistent with this, though in our case debtor countries can will have higher output than in their model because we assume full diversification while they assume no diversification and therefore high required risk premia.

regions have higher growth than more developed regions and, as a result, are attracting capital from other regions; an example is the U.S. southern states in the 1950s.[19] We run a second set of regressions that are informative about *net* capital flows and examine the relationship between the *level* of the output/income ratio and the level of output. We interpret the ratio as a proxy for past net flows; i.e., a measure of development finance.

One caveat of the measure for development finance is that it is not tied as closely to the model as the measure of diversification finance. Even if capital is flowing to rich and productive regions this measure may fail to account for this for the following reasons: 1) Profits paid from a region may be temporarily large relative to past investments (leading to a low output/income ratio), for example in case of oil rich regions receiving wind-fall gains due to sudden surges in world oil prices and 2) governments may interfere with income flows which will distort our measure. For example, governments may support private investment or engage in public investment in declining coal mining regions. In such a scenario capital ownership may be well diversified (high degree of diversification finance) but net capital flows are minor (low degree of development finance). It is also feasible that governments systematically divert funds to poorer regions for development reasons. Indeed we find that high output regions hold negative asset positions in northern Europe but not in the South (Portugal, Italy, and Spain). Comparing results using income before and after transfers and subsidies indicate that the result for the South is, at least partly, due to government subsidies and taxation channelling money to low output regions.

Overall, we find evidence that capital market integration within the EU is less than what is implied by theoretical benchmarks and less than what is found for U.S. states.[20] We also find little evidence that institutions matter for intercountry capital market integration in the EU while we find that regions with high confidence and trust levels are more financially

[19]Note that Gourinchas and Jeanne (2007) and Prasad et al. (2007) find exactly the opposite in a developing country context; i.e., they find capital goes to *less* productive countries and a positive correlation between current account and growth, respectively.

[20]We focus on integration through flows of production capital and thus our results are complementary to those found in the ECB (2007) report, which show increased integration among money and bond markets but less integration in the banking sector. See also Giannone and Reichlin (2006) for risk sharing and volatility within EU and Lane (2006) for a survey on the effects of the EMU.

integrated with each other within countries.

The paper proceeds as follows. Section 2 presents the model, where details are presented in the Appendix. Section 3 lays out the econometric specifications and Section 4 describes the data. Section 5 undertakes the empirical exercise and Section 6 concludes.

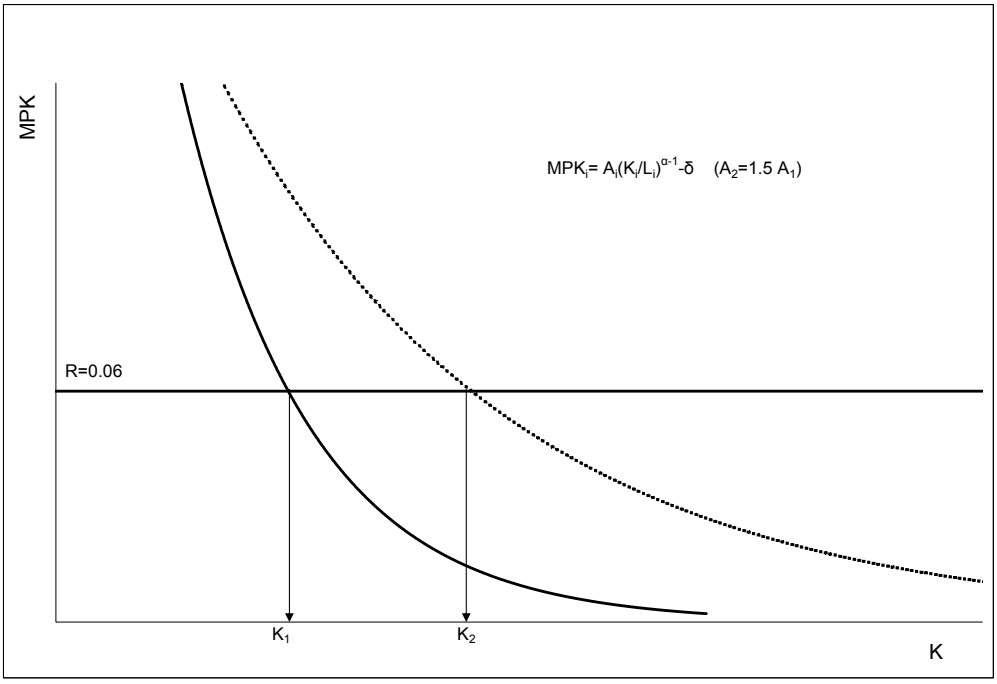
2 Benchmark Model

Consider regions $i = 1, ..., N$, with labor force L_{it}. Output at time t is Cobb-Douglas: $GDP_{it} = A_{it}K_{it}^{\alpha}L_i^{1-\alpha}$, where K_{it} is capital *installed* in state i. The aggregate (the sum of all the regions considered) capital stock installed is K_t and K_t is also total capital *owned*. Region i owns a positive share ϕ_{it} of the total so capital *owned* $\phi_{it}K_t$ where $\Sigma\phi_{it} = 1$ and and $K_t = \Sigma K_{it}$. Productivity levels differ across states. The ex ante rate of return to investment is R_t for all states and the relative amount of capital installed in each region will be determined by the equilibrium condition that the marginal return to capital equals the interest rate.

The equilibrium condition is illustrated in Figure 3. The MPK schedule shows how marginal product varies as the capital stock increases. For given labor force, productivity, and depreciation rate (δ), an increase in the capital stock will reduce its marginal product due to the law of diminishing returns.[21] The aggregate interest rate is constant (assumed to be 0.06). The interest rate can be a world interest rate or an endogenously determined equilibrium interest rate but in our application with many regions the interest rate can be considered given for individual regions, akin to a small open economy assumption. The domestic capital stock is determined by the equation $MPK = R$. The equilibrium capital-labor ratio is higher in region 2 with higher productivity than in region 1. In Figure 3, the MPK schedule for the high productivity region is given by the dashed line and the MPK schedule for the lower productivity region is given as the solid line. The level of productivity is set to be 1.5 times higher in the high productivity region; i.e., $A_2 = 1.5A_1$.

[21] Note that the return to capital, α is assumed to be 1/3.

Figure 3: Equilibrium Capital Stock as a Function of Productivity



We show the deterministic version of our model for simpler exposition. A more detailed model would allow for uncertainty but under the assumption that capital ownership is fully diversified risk premiums would be negligible. Kraay and Ventura (2002) argue that countries tend to hold all physical capital installed in their own country and this lack of diversification is an important explanation for international investment patterns. This may well be true for countries but in this paper we measure the deviation from our simple benchmark model and do not attempt to explain why country-level data may deviate.[22]

The aggregate capital income is $R_t\,K_t$ and the wage rate in region i is $w_{it} = (1-\alpha)A_{it}K_{it}^{\alpha}L_{it}^{-\alpha}$. Income, GNI, in region i is, therefore, $GNI_{it} = \phi_{it}\,R_tK_t + w_{it}L_i = \phi_{it}\,R_tK_t + (1-\alpha)A_{it}K_{it}^{\alpha}L_i^{1-\alpha}$ and the GDP/GNI ratio is

$$\frac{GDP_{it}}{GNI_{it}} = \frac{A_{it}K_{it}^{\alpha}L_i^{1-\alpha}}{\phi_{it}\,R_tK_t + (1-\alpha)A_{it}K_{it}^{\alpha}L_i^{1-\alpha}} = \frac{GDP_{it}}{\phi_{it}\,R_tK_t + (1-\alpha)GDP_{it}}\ . \tag{1}$$

We allow for changes in the labor force due to migration. We consider two cases: a) migrants bring no assets and b) migrants bring average assets. Other cases can easily be interpolated or extrapolated from these. In case a) $dGNP/dL$ is $(1-\alpha)\,dGDP/dL$ as migrants will only receive labor income while in case b) $dGNP/dL = dGDP/dL$. When capital instantly flows to restore the capital labor ratio, $dGDP/dL = (GDP/L)dL$ because the per capita capital stock will be unchanged leaving per capita output unchanged. We get in case a)

$$d(\frac{GDP_{it}}{GNI_{it}}) \approx \alpha\,\frac{d(GDPit/L_{it})}{GDP_{it}/L_{it}}\,, \tag{2}$$

and in case b)

$$d(\frac{GDP_{it}}{GNI_{it}}) \approx \alpha\,\frac{d(GDPit/L_{it})}{GDP_{it}/L_{it}} - \alpha\,dL_{it}/L_{it}\ . \tag{3}$$

It is obvious that the ratio of output to income will be decreasing in the ownership share ϕ_{it} of region i for given output. The ratio will be temporarily increasing when a region is hit by a productivity shock but Kalemli-Ozcan et al. (2007) show that for typical parameter

[22]Recall that we find in earlier work that our benchmark model fits U.S. intra-national investment patterns well.

values a region's output/income ratio will converge back to the equilibrium value of unity if no further productivity shocks hit, with a half-life for the deviation of about 15 years.[23]

Consider for simplicity the case where all ownership shares initially are identical and equal to $1/N = L_{it}/L_t$, where depreciation is nil, and where L_t is aggregate population and where regions j outside of region i has $A_{jt} = A_t$ and region i is negligible in the total. For $\phi_{it} = 1/N$, we have $\phi_{it} R_t K_t = \frac{1}{N} R_t K_t = \frac{1}{N} \alpha GDP_t$, and the predicted GDP/GNI ratio for identical ownership shares and varying productivity levels is $GDP_{it}/GNI_{it} = \frac{1}{\alpha \frac{GDP_t/N}{GDP_{it}} + (1-\alpha)}$; i.e., after controlling for ownership shares, regions with relatively high output per capita will have high values of the output/income ratio. We do not observe ownership shares by region so we are limited to examining the relation of the output/income ratio to output. We can imagine three cases: 1) the output/income ratio is high in high output states—we expect to find this where capital markets are highly integrated, output has little correlation with ownership, and the government doesn't interfere with geographical flows of income or investment; 2) the output/income ratio has a negative relation to output—we expect to find this relation during "catch-up" growth where formerly poor regions (with current low ownership shares) grow fast; or 3) little relation between the output/income ratio and output—we expect to find this where government tend to direct income flows or where markets are badly integrated.

Finally, we show how the output/income ratio varies with productivity in the simple case where state different from i are identical:. Since $K_{it} = L_{it}(\frac{\alpha A_{it}}{R_t})^{\frac{1}{1-\alpha}}$, we get $\frac{K_{it}}{K_{jt}} = (\frac{A_{it}}{A_{jt}})^{\frac{1}{1-\alpha}}$ and when $K_{jt} = K/N$, this implies $K_{it} = K_t/N * (\frac{A_{it}}{A_t})^{\frac{1}{1-\alpha}}$ and we have the output/income ratio in terms of productivity levels $\frac{GDP_{it}}{GNI_{it}} = \frac{1}{\phi_{it} N \, \alpha (A_t/A_{it})^{\frac{1}{1-\alpha}} + (1-\alpha)}$. See Kalemli-Ozcan et al. (2007) for more details.

[23] More precisely, they assume that the saving rate is constant across regions at 15 percent, $\alpha = 0.33$, and a depreciation rate of 5 percent per year.

3 Econometric Model

We describe our regression specifications at the regional level. The country level regressions are quite similar. The regressions are motivated by our benchmark model. The model assumes that capital ownership is fully diversified across regions and that capital adjusts to the equilibrium level within one period following productivity shocks. The model ignores adjustment costs and business cycle patterns and is intended as a model for the "medium run." The main implication of the model is that when capital ownership is diversified then an increase in productivity will lead to an increase in growth. But the increase in output will be followed by a lower increase in income because the share of income going to capital—typically found to be one-third—is going to capital owners in other regions. The output/income ratio will, therefore, be expected to increase by about one-third times the increase in output.

We calculate the ratio of output to income for each region i in each year t. We compute $(\text{OUTPUT}/\text{INCOME})_{it} = \frac{\text{GRP}_{it}\,/\,\text{INC}_{it}}{\text{GRP}_{t}\,/\,\text{INC}_{t}}$, where $\text{GRP}_t = \Sigma_i\,\text{GRP}_{it}$, $\text{INC}_t = \Sigma_i\,\text{INC}_{it}$ and GRP_i is gross regional GDP of region i, INC is personal income, and the summation is over the regions of all EU countries in our sample. We scale the ratio because personal income is systematically lower than GDP which includes depreciation and because EU-wide aggregate current account deficits and surpluses may change the ratio.[24] The ratio $(\text{OUTPUT}/\text{INCOME})_{it}$ captures region i's output/income ratio in year t relative to the aggregate output/income ratio of the EU.

3.1 Change Regressions

Our main regression tests if capital ownership is fully diversified. The specification takes the form

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

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

[24] As is clear from Table 2 non-scaled output/income ratios are much bigger than unity.

sign because that would create a spurious correlation between the left- and right-hand sides. The change in the output/income ratio is calculated for 7 years, rather than 1, in order to capture "medium run" changes and to minimize noise. We use the longest sample of consistent data available to us. GDP growth on the right-hand side is per capita for 3 years in order to minimize the impact of short term fluctuations.[25] The period 1991–1994 is fairly short for our purpose but fortunately growth in Europe was quite high during this period with significant regional variation after the unification of Germany.[26] μ_c is a dummy variable for each country—if countries within the EU were fully integrated the coefficients to the dummy variables would be identical but the data clearly rejects this assumption. This is consistent with the country-level results presented below.

We also estimate the relation

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

where we allow the coefficient to regional growth to vary across countries and we will test if the statistical hypothesis $\alpha_c = \alpha$ (i.e., that the slope coefficients are identical) can be accepted.

We further add variables on the right hand side as suggested by our model. We add population growth from 1992 to 1994. If population growth is dominated by migrants arriving with few assets then this increase the output but not income and therefore boost the output/income ratio. If changes in population are dominated by wealthy retirees moving out (or dying) this will lower income and also increase the output/income ratio. We further include the lagged, 1995, output/income ratio. The output/income ratio is mean reverting if the saving rate is constant and the same for labor and capital income: when a (relative) positive productivity shock hits a region, output goes up more than income, but wages also go up and higher wages, in connection with a constant saving rate, will lead to higher in-

[25] We have available 4 years of regional output constructed using a different base year than the later data.

[26] Kalemli-Ozcan, Reshef, Sørensen, and Yosha (2007) find that the results for the United States are not very sensitive to the period length as long as it is not very short.

come and saving and eventually the output/income ratio will approach unity in the absence of further shocks. Hence the lagged ratio will have a negative coefficient.

If ownership of capital is fully diversified, we expect to find an estimated α-coefficient of about 0.33. If we find a coefficient smaller than this, we may ask if some regions are better integrated than others. For example, are regions where individuals endowed with higher levels of social capital more diversified than other regions? We examine this question by estimating the regression

$$\Delta(\text{OUTPUT}/\text{INCOME})_i \;=\; \mu_c + \delta X_i + \alpha\,\Delta \log \text{GDP}_i + \gamma\,(X_i - \overline{X})\,\Delta \log \text{GDP}_i \;+\; e_i, ,$$

where X_i refers to an "interaction" variable that measures the average level of social capital (measured by confidence or trust) in the region and the coefficient γ to the interacted term captures whether the output/income ratio reacts more to growth where the level of social capital is high.[27] If γ is positive and significant we interpret this as showing that capital markets are more integrated between regions with high trust and confidence. We include the non-interacted effect of X because the non-interacted effect might have a direct effect on income and/or output via savings and if the X-term is left out this could spuriously be captured by the interaction term. As interactions, we will also use indicators of institutional quality, available at the country level.[28]

3.2 Level regressions

The level of capital income flows, approximated by the level of the output/income ratio will typically reflect past net capital flows (i.e., development finance). The level regressions take the form

$$(\text{OUTPUT}/\text{INCOME})_i \;=\; \mu_c + \alpha_G\,\log \text{GDP}_i \;+\; e_i\,,$$

[27]The interaction variable X is demeaned in order to keep the interpretation of the γ coefficient unchanged as explained by Ozer-Balli and Sorensen (2007).

[28]In this case there will not be a direct main effect of X because it gets absorbed by the country dummies.

where the output/income ratio is averaged over 1995 to 2003 and $\log \text{GDP}_i$ on the right hand side, which we refer to as "initial GDP" in this setting, is averaged over 1991–1994.[29] α_G varies across groups of countries and we test if this model can be accepted against a model where the coefficient α_c vary across all countries.[30] We also estimate regressions of the form

$$(\text{OUTPUT/INCOME})_i \;=\; \mu_c + \delta X_i + \alpha_G \log \text{GDP}_i \;+\; \gamma\,(X_i - \overline{X}) \log \text{GDP}_i \;+\; e_i\,,$$

in order to examine if "X" variables, such as trust or confidence, are related to whether the output/income ratio is high or low in countries with different levels of initial output. Again, we include the non-interacted effect of X since the non-interacted effect might have a direct effect on income and/or output via savings and if the X-term is left out this could spuriously be captured by the interaction term.

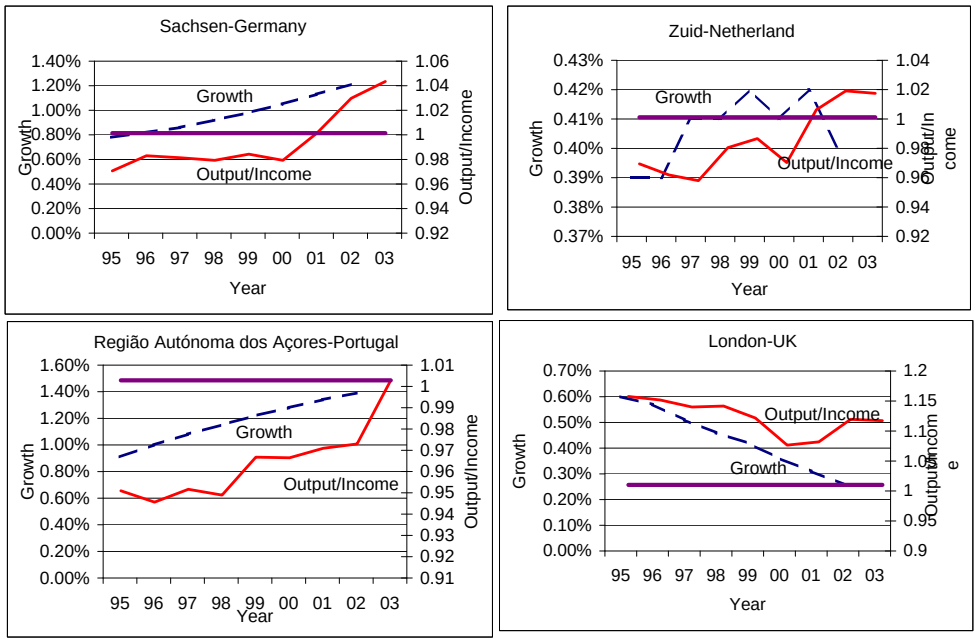
4 Data

Our analysis is performed for the 168 NUTS2 regions including the countries for which we have data with more than one region. If regions are too small income patterns may reflect commuting rather than capital income flows and we, therefore, also performed most of our regressions at the 65 larger NUTS1 level regions and found similar results. An exception to this is Greece, which also has the character of an outlier, being less economically developed than most of the other countries in our sample. Statistical tests for pooling of data also found that Greece didn't fit the pattern of other countries. Therefore, we decided to exclude Greece from the analysis. We construct a mixed sample of 105 NUTS1 and NUTS2 regions for the regressions that uses data from World Values Survey to match the regional specification in World Values Survey. We describe the World Values Survey in more detail in the data appendix but the data we use are based on individual level surveys which we aggregate to the

[29] The 1992–1994 growth rates used in the change regressions are based on 1991–1994 levels data.

[30] We initially tested if the coefficients for all countries could be accepted to be identical, this statistical hypothesis was clearly rejected.

Figure 4: Regional Growth and Output Income Ratio



NUTS1 and NUTS2 level as a mixed sample. We also take the average over the 2 questions in the survey involving trust and over 11 relevant questions involving confidence in order to minimize noise—for robustness we also examine an average of 3 questions about confidence, the trade-off is that using less variables may lead to a more noisy measure while the benefit of using only 3 question is that these questions may be the more relevant.

4.1 Graphical Evidence

In Figure 4, we display the regional output/income ratio versus regional relative growth (the regional growth rate minus the growth rate of the country to which the region belongs) for a selection of NUTS1 regions for 4 selected regions from sample. We selected regions, from

different countries, that display changes in growth in order to get a visual impression of whether changing growth is reflected in changing output/income ratios. One can observe from Figure 4 that a region with high relative growth such as Sachsen of Germany have experienced an increasing output/income ratio. London of the UK is an example where relative growth went down 1% yearly and output/income ratio went from 1.15 to 1.05.[31]

4.2 Descriptive Statistics

Table 1 reports the mean and standard deviations (across the 14 countries) of the dependent and independent variables used in our country-level regression and also the averages of three institutional variables that will be used as interaction terms—these institutional variables are not available by region. The GDP/GNI ratio has a mean of about 1 and has a standard deviation of 0.04. A value of, e.g., 1.04 means that 4 percent of value produced shows up as income in other countries on net. Capital inflows (the sum of current accounts with sign reversed) and net assets have large standard deviations of 34 and 9 percent, respectively. GDP growth 1992–1994 has a standard deviation of about 1 percent. Average population size of the NUTS2 regions varies from a low of 870,000 in Austria to a high of 3.32 million in Portugal. We report the mean values of principal components for the institutional quality indicators, "property rights institutions," "legal regulations," and "financial regulations." The value of the principal components are not interpretable but we report these numbers chiefly to evaluate the variation and we see that the financial regulations variable shows the highest variation across countries.[32]

Table 2 reports descriptive statistics for NUTS2 regions of every country. Within countries, the output/income ratio shows larger variation compared with that found between countries, except for Italy and Spain. (The country-level average value of the income/output

[31] Such patterns are more clear for U.S. data, see Kalemli-Ozcan, Reshef, Sørensen, and Yosha (2007).

[32] A principal component for a group of variables is the variable that is a linear function of the original variables and maximize the variation over time. While it doesn't have a very clean interpretation it is a commonly used method to summarize information in a group of variables that are not practical to all include in a regression.

ratio is not going to affect our regression results which all include dummy variables for each country.) Average GDP is fairly similar across countries with Spain being in the low range and Portugal having substantially lower output than other countries. Per capita growth from 1991 to 1994 varies from negative in Spain, Italy, and Sweden, to 8.32 percent in Germany. Trust is highest in the Netherlands and Germany and lowest in Italy and France. Trust shows the highest variation within Spain. Confidence is highest in Portugal and lowest in Germany and Spain with Germany showing the largest amount of variation. This is partly due to several regions in the former DDR displaying low confidence. Factor shares show some variation, especially the share of manufacturing which is 23 percent in the UK but only 9 percent in Portugal who also have the largest share of agriculture. The fraction of retirees is largest in Sweden and lowest in Portugal. Measured by population regions are smallest in Belgium and the Netherlands and largest in Portugal.

4.3 Correlation between Regressors

Tables 3 and 4 display the matrix of correlations between the regressors (and the regressand) in levels and in changes for countries and NUTS2 regions, respectively. For countries, past capital inflows (cumulated current account deficits) and net asset variables are negatively correlated and so are past growth and the output/income ratio. Current growth and the output/income ratio are very highly correlated but this may reflect that these numbers are constructed using the exact same output series.

For NUTS2 regions most correlations are fairly small, the highest correlations being the output/income ratio with finance share at 0.43 and finance share with manufacturing share at –0.32. Note that the social capital variables, trust and confidence, have a correlation of only 0.04. Growth has been high in regions with high confidence but not in regions with high trust.

5 Empirical Analysis

5.1 Does the output/income ratio capture past current accounts?

We perform regressions where countries are the units of observation in order to establish that the ratio of output to income is a reasonable measure of past capital flows. We can check this because current accounts and asset holdings are available at the country level but not at the regional level. In Table 5, we examine the relations between past current accounts, net asset holdings and output/income ratios. We show results with and without Ireland since Ireland is well known to have a substantially more open economy than most other countries; however, the Irish data may also have some problems due to tax arbitrage of multinational corporations. In the first two columns, we examine if net foreign asset holdings are correlated with past current accounts. As expected, we find a positive relation—with or without Ireland—with significance levels of about 5 percent. We further examine if past current accounts are negatively correlated with the ratio of output to income in the next two columns. We find the expected negative relation when Ireland is left out, but a non-significant positive coefficient when Ireland is included. While our focus is on EU countries, in the last two columns we verify that past current accounts typically predict negative output asset ratios using a sample of 24 OECD countries. We find in the last column that such a relation is highly significant statistically, even though Ireland is a strong outlier that including her brings the level of significance down below the 5 percent level. Overall, the results of Table 5 confirm that the income/output ratio is able to capture past current accounts even though countries with strongly divergent growth patterns, such as Ireland, may obscure the pattern.

5.2 Capital Flows between EU countries

In Table 6, we examine the prediction that relatively high output growth leads to an increase in the output/income ratio. When Ireland is included in the sample, we find a coefficient of 0.35 which is exactly the predicted magnitude. The coefficient is not significant and the reason can be inferred from the second column which shows that when Ireland is left

out, the positive relation totally disappears and high growth countries show no tendency to attract capital from other countries. Columns (3) and (4) include population growth and the lagged ratio of output/income. When Ireland is included, we find a very large coefficient to population growth, which indicates strong immigration of individuals with low assets (likely young people) who contribute more to output than to income (although the coefficient is imprecisely estimated and the point estimate seems too big to be meaningful). We find that, when Ireland is left out, the output/income ratio reverts almost fully to unity in the absence of further shocks but this finding is likely due to the small overall amount of capital flows. In columns (5) and (6), we examine if high growth is associated with large current account deficits and we find no significant patterns. In the last two columns of Table 6, we regress the *level* of the output/income ratio on output and find an insignificant coefficient near 0. These findings are consistent with the well-known observation of Feldstein and Horioka (1980) that saving and investment are highly correlated at the country level.[33] Blanchard and Giavazzi (2002) point out that in recent years the developing economies of Greece and and Portugal have received large capital inflows and suggest that this might herald the "end of the Feldstein-Horioka puzzle" at least within the EU, but our results indicate that the process still may need some time before capital adjusts as freely as between U.S. states.[34]

5.3 Change Regressions: NUTS2 Regions

5.3.1 Tests for Pooling

Our regressions using NUTS2 regions are all performed with a dummy variable included for each country. Country-level capital flows do not appear to follow the open economy model well due to reasons that are beyond the scope of this paper. By including the dummies all our results have the interpretation of capturing *within* country flows rendering any country

[33]In our model, a productivity shock leads to capital inflows; i.e., investment, financed by the entire EU (if integrated) while the savings rate is constant. Therefore, savings and investment are not correlated.

[34]See also Abiad et al. (2007) who find results similar to those of Blancard and Giavazzi in the sense that capital in Europe flows "downhill" from rich countries to poor countries in accordance with the neoclassical model.

specific feature irrelevant. The patterns of *within* country capital flows may be similar in different countries, in which case we can pool the countries. We are mainly interested in whether high growth regions attract capital and whether high output regions are net debtors or creditors. We will turn to the latter question later but we present all tests for pooling in Table 7. The first two columns show regressions of the change in the output/income ratio on growth and the last two columns treat the regression of the level of the output/income ratio on the initial level of output.

In the first column, we allow for the coefficient to initial growth to vary across countries. The point estimates vary substantially by country but the country-level intercepts are not precisely estimated. In the second column, we impose the restriction that the coefficient to initial growth is identical in all regions, independently of country. We find that this restriction can be accepted statistically.[35] In the third column, we see that net capital flows between regions display large differences between countries. There is a strong tendency for regions with high output to have a high output/income ratio in the Netherlands and Belgium, a significant but somewhat lower tendency in Austria, France, Germany, Sweden, and the UK. In Portugal and Spain, there is no tendency for the output/income ratio to be related to output, while in Italy the estimated coefficient is positive and tiny but very precisely estimated. In column (4), we show the coefficients to output when the Netherlands and Belgium are pooled into a "North1" group, Austria, France, Germany, Sweden, the UK are grouped into a "North2" group, and Italy, Portugal, and Spain are combined into a "South" group. Countries can be accepted statistically to be identical with each of these groups.[36] There are clear differences in the patterns of net capital flows between northern and southern Europe which will be explored in the next Section.

[35]We calculate an F-statistic of 0.77, which is below the F(148,9) 5 percent critical value of 1.94 (148 is the number of observations minus the number of parameters estimated in the unconstrained model and 9 is the number of restrictions imposed in the constrained model).

[36]We calculate an F-statistic, finding a value of 2.00. The F-statistic is below the F(148,7) 5 percent critical value of 2.07 implying that this hypothesis is not rejected.

5.3.2 Change Regressions, Population Growth, and Lagged Output/Income

Table 8 displays the pooled coefficient to initial growth in the first column. The coefficient is positive and significant, consistent with high growth regions receiving capital from other regions in the country. However, the coefficient is clearly (and statistically significantly) below 0.33 indicating that capital ownership is not fully diversified within EU countries. In the second column, we add population growth and find a negative (not quite significant) coefficient. This coefficient may indicate that migration is dominated by high net worth residents, possibly retirees. Finally, we include the initial level of the output/income ratio and find a negative coefficient consistent with mean reversion, although the coefficient is smaller than expected and not quite significant.

Why may EU countries have less integrated regions than the United States? There are few formal barriers to capital flows between regions within EU countries but we suspect that financial and industrial development may explain the differences. If EU countries have more independent farmers and proprietor-owned small firms we might expect regional income to be tighter related to regional output than in the United States where more firms are incorporated and listed on exchanges where ownership shares are traded in nationwide market. Financial development may, however, also matter for small firms, for example, if nationwide insurance companies insure the value of farm output against, say, hail damage, the insurance companies to some extent become "owners" of a part of output. "Insurance" of the value of output through trading on futures markets for hogs or grains have a similar effect and even nationwide banks to some extent share in output by giving loans to small firms—even if loans have a fixed interest rate the repayment become partly state-contingent if the loans are not repaid due to default in periods of low output. We do not attempt to directly measure differences in these types of financial instruments between the United States and Europe—maybe such a task is infeasible—but our hunch is such differences are behind the divergence of the U.S. and EU results.

5.3.3 Regional Social Capital and Within Country Financial Integration

We turn to the major focus of our investigation, namely whether trust and confidence are important determinants of capital mobility. We address this question by interacting the level of trust or confidence with initial growth. If the coefficient to the interacted variable is positive this indicates that capital flows more readily to high growth regions in areas within countries where the level of trust (confidence) is high and capital leaves slow growth regions more rapidly. We also include confidence and trust in non-interacted form because a potential left-out non-interacted variable might spuriously make the interaction term significant. We present the correlation matrix for our variables in Table 9. We can observe, among other things, that trust and confidence are positively correlated, as also found in the previous sample, but the two variables measure quite different things as the correlation is only 0.22. In general, the correlations between these regressors are fairly low implying that the regression analysis should be able to identify the effect of the individual variables.

Table 10 presents the regression of the change in the output/income ratio on initial growth and initial growth interacted. We find with a 10 percent level of significance that regions with higher confidence tend to have a lower output/income ratio; i.e., export capital to other regions. This result is not unreasonable but given the borderline level of significance and because it is hard to verify the robustness of this result we hesitate to stress it. Our main object of interest is the interaction term and we here find a highly significant coefficient of the expected sign: capital flows much more freely from low to high growth regions in areas of high confidence. The t-statistic is a high 3.88 and the coefficient implies that the regions with the highest confidence[37] (a logged and demeaned value of 0.38) has a coefficient to growth of 0.24*0.38+0.19=0.28—very close to the expected value from our benchmark model. Individuals need to feel confident in the institutions that provide financial intermediation, in the ultimate recipients of capital, and in the legal system, so the result is perfectly intuitive and in support of Guiso et al. (2004) and (2005).

[37]The demeaned interaction term for confidence has a range from –0.71 to 0.38 and the range for trust is from –1.81 to 0.79.

Alternatively, in column (3), we use trust as an interaction variable. We find the expected sign for this variable with a significance level of between 5 and 10 percent but the point estimate is substantially lower than that found for confidence. In columns (4)-(6) we include the lagged output/income ratio and population growth but these variables appear quite orthogonal to the interaction terms and do not change the results.

In Table 11, we include the trust and confidence variables together. Trust now becomes less significant while the confidence variable is estimated at the same order of magnitude and still with high significance—clearly the data can separate between these two variables and clearly confidence matters more.[38]

Table 12 examines robustness. We first examine if the estimated effect of confidence is sensitive to the exact choice of questions asked. One might expect that confidence in such institutions as parliament, major companies, and the justice system might be more important for financial integration. We therefore in column (1) show the regression obtained using a "core confidence" measure constructed from the subjects expressing confidence in these three institutions. The coefficient to the interaction term is smaller than for the "full" confidence index, maybe reflecting more noise when averaging over a lower number of variables, but the coefficient is still clearly significant. Also, the range of the "core confidence" measure is larger implying that the smaller coefficient only partly implies less variation explained.[39]

One might worry that social capital can be endogenous to economic development. In this case our results simply reflect that high growth, or more developed, regions have high trust and also a high level of financial integration between themselves. In order to examine if the interaction of confidence and initial growth may act as a "stand-in" for an interaction of, say, high output and initial growth, we include an interaction term of initial output and growth and see if this renders the interaction of confidence and growth insignificant. The results are clearly at odds with this idea, the interaction term with initial output is very small with a minuscule t-value. Alternatively, we include a squared term in growth. If confidence and

[38]It is feasible that confidence simply is more precisely measured as the index of confidence is based on the answer to 11 questions while the index of trust is based on 2 questions.

[39]The range of the demeaned core confidence measure is from –1.22 to 0.41.

growth are correlated and the relation between output/income and growth is non-linear the interaction term might simply capture a left-out quadratic term.[40] However, the data do not support a quadratic term in growth. The regressions using trust as the interaction terms are also robust to these potential problems.[41]

5.3.4 Country Institutions and within Country Financial Integration

The quality of institutions in a country may be crucial for the patterns of capital flows. We have three sets of indices for the institutional environment, namely principal components for variables measuring the security of property rights, the quality of the legal system, and regulations affecting financial markets directly. The variables are available to us by country only and our main goal is to examine if these institutional indices might explain why some countries are more financially integrated *within* than others; i.e., we use the country-level indices interacted with regional-level initial growth or (in the levels regressions) with the initial regional output level.[42] Table 13 shows the correlation matrix for the interacted indices with each other and with initial growth and output and with the change and level of the output/income ratio. The most notable correlation is the one between property rights institutions interacted with growth (initial output) and legal regulations at 0.85 (0.89).

We report results for institutional indices in Table 14. These results have a different interpretation than the regressions involving trust and confidence where we searched for differences between regions. Here we attempt only to find differences *between countries* in the patterns of *within-country* interregional capital flows. However, none of the indices are

[40] See Ozer-Balli and Sørensen (2007) about potential problems in the use of interaction terms.

[41] Another worry might be reverse causality although it is not so obvious why the interaction of growth with attitudes might be caused by net capital flows. In an attempt to examine this issue we try to instrument the social capital variables with religious composition and got significant results—however, the point estimates are large and hence hard to interpret. We do not tabulate these results.

[42] Guiso et al. (2004) measure domestic financial development for Italian regions as the probability that the household will be shut out from the credit market. They find that local financial development matters for firm growth even in a *de-jure* integrated market such as Italy. Their Feldstein-Horioka regressions show positive correlations between saving and investment for Italian regions, which makes Italy a *de-facto* non-integrated market. They interpret this as follows: even if money easily can be moved from a bank in Milan to a bank in Naples, it can not finance projects in Naples without the help of a local intermediary who screens good from bad projects.

significant in explaining differences in diversification. Of course, this is consistent with the test reported in Table 7 where the assumption of identical slopes across countries could not be rejected.

5.4 Level regressions: Net capital Flows across NUTS2 Regions

Our results in Table 7 indicate large differences in net ownership between countries in northern and southern Europe. To recapitulate: in Belgium and the Netherlands ("North1") high output regions are debtors, in Austria, France, Germany, and the UK ("North2") this is also true but the pattern is less strong and in Italy, Portugal, and Spain ("South") we find no correlation between output and the output/income ratio.

5.4.1 Does Trust and Confidence Explain Net Capital Flows Across Regions?

Table 15 examines if the differences between net flows in the north and south of Europe can be explained by differences in trust and confidence. The first column shows the regression with the two North dummies, redone for the smaller sample where the trust and confidence variables are available. The econometric setup is slightly different here than in Table 7. Here, we include initial income and initial income interacted with the North1 and North2 dummies rather than initial income interacted with each of the three dummies. The coefficient to initial income will be the same as to the South dummy in the previous table but now the coefficients to the North dummies captures the *difference* between these regions and the South regions. The reason for this change is that we are interested in testing if the inclusion of variables, such as confidence, may *explain* the differences between countries and in the present formulation a variable can be said to explain the difference between the countries if it makes the interaction of initial output with the North1 or North2 dummies insignificant as measured by the t-statistic. On the contrary, if the regression with both dummy variables and, say, confidence shows significant coefficients for the North dummies and an insignificant coefficient to confidence then confidence cannot be said to explain the north/south pattern—

it may be part of the explanation but not the full explanation.

In column (1), we present the regression of the output/income ratio on initial output and initial output multiplied by the North1 and North2 dummies. Country dummies are also included but not displayed. For this sample the coefficient to initial output (i.e., the non-interacted term) is positive and insignificant but both the North1 and North2 dummies are significant indicating a larger tendency for capital to flow to high output states in the northern countries. Including an interaction term for confidence results in a positive coefficient but it is not significant at the 10 percent level. Including the term together with the North1 and North2 dummies renders the coefficient very small. Trust has a small coefficient in column (4) but a negative coefficient when the North/South dummies are included. Overall, confidence and trust do not seem to explain the relation between regional output and net capital flows.

5.4.2 Do Country Level Institutions and Regulations Explain the Difference between Northern and Southern Europe?

In Table 16, which uses the full sample of 168 regions, we examine the role of institutions related to 1) property rights such as corruption or expropriation risk), 2) legal variables such as duration of check collection or enforceability of contracts, and 3) financial regulation variables such as investor protection and disclosure requirements.[43] In order to summarize the information within each group of institutional variables, we calculate the principal components which summarize the information in the constituent variables. Table 16 shows the results when the principal component is interacted with initial output and the regression is done with or without the North dummy interactions. (The principal component in non-interacted form are not included as they would be perfectly collinear with the country dummies.) We find that property rights are highly significant with high output regions in countries with good property rights being net debtors consistent with capital moving to high output regions in countries with better property rights. When we include the North dum-

[43] See Table 22 in the appendix for the complete list.

mies we see that the property rights principal component can explain the difference between North2 countries and South countries (and the difference to the North1 counties of Belgium and the Netherlands become slightly smaller). Legal variables are highly significant when the North dummies are not included but clearly not significant when they are—it appears that the legal variables are not the full explanation of North/South differences. Financial regulation variables are not significant even when the North/South dummies are left out and do not appear to explain net capital flows.

It is somewhat hard to interpret principal components so, in Table 17, we study the role of the property right variables in more detail. Ideally, one would like to know which of the 5 components of "property rights" are the relevant ones for capital flows and a multiple regression that allows for all the variables in the same regression should point to the more important variable or variables. Due to the high collinearity we didn't get significant robust results in such regressions. (This is to be expected because we are trying to infer this from the difference between 8 countries and with 5 components, which leaves few degrees of freedom.) We, therefore, in Table 17 examine which components have explanatory power for capital flows when the components are included one-by-one. When the North dummies are left out all components are significant so we cannot rule out that all the components may play a role. However, when we include the North dummies we find that the Bureaucratic Quality variable is no longer significant. Likely, this variable is less important. The No Corruption variable changes sign and the coefficient to the North1 interacted dummy becomes very large which indicates that the No Corruption variable is too highly correlated with this variable to be estimated precisely. Therefore, we doubt that the negative estimated coefficient is meaningful. Law and Order, No Expropriation Risk, and Government Stability all remain significant when the dummies are included, and each of these variables have enough explanatory power to render the North2 variable insignificant. In other words, these variables all have the potential to explain the difference in the patterns of within-country capital flows in the south and the north of Europe. Unfortunately, we cannot separate out if one (or more) of these three variables is the more important variable(s).

5.5 Net Capital Flows and Industrial Structure

In Table 18, we explore if net capital tends to flow to regions with a certain industrial structure. We explore this by including in the regressions the regions' share of manufacturing, agriculture, finance, and mining, respectively. In steady state the output/income ratio is unity and the factor shares would only be significant if recent productivity changes have favored a sector in relative terms. We see that only the share of agriculture is significant, with a negative coefficient. This might reflect that agricultural regions have become relatively less productive and capital has been flowing to other regions. However, in the case of agriculture it is well known that the EU provides extensive income support to farmers under the Common Agricultural Policy and we suspect that this is reflected in the output/income ratio. Next, we examine if high output regions tend to have attracted more outside capital if they are focused in a particular sector. We examine this question by interacting the sector share with initial output. We find a large positive and significant coefficient to the interaction of finance share and initial output consistent with high growth areas concentrating in finance having attracted outside capital. The coefficients to the interactions with manufacture and agriculture are negative and significant at the 10 percent level indicating that high output manufacturing or agricultural regions on average are capital exporters. Finally, we find a positive significant coefficient to the interaction of mining share with initial output. This is not surprising, regions that see an increase in the value of oil or minerals typically attract capital with little delay.

5.6 The Role of Government Subsidies and Taxes

Our data set allows us to use personal income pre-tax and transfers, as we have done so far, but we also have data for disposable income defined as personal income minus taxes plus transfers. An analysis of whether the patterns of income flows differs according to the income definition will help us understand the role of government income transfers in cross-ownership across within-country regions. We perform regressions (without interaction terms) of the output/income ratio on sector shares and including the share of retirees and migration.

Such regressions, and in particular, the comparison of the results for income versus disposable income will elucidate whether governments channel income flows to regions dominated by certain industries. Because we could not statistically pool the countries we perform the regressions for the North1, North2, and South groups of countries one by one.

5.6.1 Belgium and the Netherlands

Table 19 analyzes the North1 group of countries. We find that the output/income ratio is robustly related to output levels but this is partly explained by industrial structure: large financial, manufacturing, and mining shares all predict a high output/income ratio. Migration and retirement are not significant but we see a lower output/income ratio in regions with many retirees in the last column consistent with retirees receiving substantial transfers.

5.6.2 Austria, France, Germany, Sweden, and the UK

As shown in Table 20, for the North2 countries the relation between the output/income ratio and output is robustly estimated and none of the indicators of industrial structure are significant. It is not obvious why sectoral structure matters in Belgium and the Netherlands and not in the North2 countries but exploring this topic will take us too far afield. The impact of retirement is positive and insignificant when income does not include transfers but turns significantly negative when transfers are included, consistent with retirees contributing little to output but receiving government transfers. Migration has large negative coefficients which seems to indicate that migrants arriving with high savings are more important for patterns on income flows.

5.6.3 Italy and Spain

Table 21 shows that in Italy and Spain there is a significant but very weak relation between the output/income ratio and output. The effect of industrial structure depends strongly on the income concept used: regions with a large financial sector have low output/income ratios before taxes and transfers but high output/income ratios after taxes and transfers.

Mechanically this means that regions with large financial sectors pay relatively high net taxes. The share of mining is insignificant for primary income but positive and significant for income after taxes indicating these regions pay high taxes. The share of mining turns strongly negative and significant when income after taxes and transfers are used which indicates that mining regions receive large income transfers that dominates the effect of taxes. Italy and Spain are not large oil producers and the coal mining industry in Spain is struggling to be competitive and government transfers play an important role in income maintenance. In Italy various minerals are mined and it appears that government transfers also here are important. The results for agriculture are consistent with agricultural regions paying relatively low taxes and receiving large transfers. We find that retirees receive positive transfers, while migration in Italy and Spain has the opposite sign of that found for the North2 countries indicating that low net worth individuals may be dominating migration in Italy and Spain.

6 Conclusion

Culture matters for financial integration. We showed that ownership of capital for European regions are less than fully diversified within countries (not to speak of between countries) but for regions with high confidence or trust the level of financial integration is consistent with full integration.

We find large net capital flows to high productivity regions within countries of northern Europe, whereas we find weak evidence for regions of southern Europe. The differences in the findings for the northern and southern 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.

7 Data

7.1 Statistical Regions of Europe and Data Sources

Due to increasing demand for regional statistical data, Eurostat set up the system of "Nomenclature of Statistical Territorial Units" (NUTS) as a single, coherent regional breakdown of the European Union. This division is also used for distribution of the Structural Funds to regions whose development is lagging behind. For practical reasons of data availability and policy implementations, the division favors the "normative criteria" which are based on political will, and fixed boundaries stated by member countries, rather than some "functional criteria" which specifies the regional breakdown with geographical criteria such as altitude or soil type, or by economic and social criteria such as the homogeneity, complementarity, or polarization of regional economies. NUTS subdivides each member state into a number of regions at the NUTS1 level. Each of these is then subdivided into regions at NUTS level 2, and these in turn into regions at NUTS level 3. The minimum and maximum thresholds for the average population size of the NUTS regions at each level is reported below.

Thresholds for the Average Size of NUTS Regions

Level	**Minimum**	**Maximum**
NUTS1	3 million	7 million
NUTS2	800 000	3 million
NUTS3	150 000	800 000

Data sources are the Eurostat electronic database, the World Bank World Development Indicators (WDI), Lane and Milesi-Ferretti (2006),[44], the International Country Risk Guide (ICRG), various papers for institutional variables cited in the descriptions, and the World Values Survey data for social capital regressions. For regional regressions, we use the data from Eurostat. WDI and LM data are used for the country level current account regressions.

[44]Henceforth LM data.

7.2 Regional Data for Level and Change Regressions

Availability of output and population data for the initial years 1991-1994 to calculate the initial per capita output, and Gross Domestic Product and Personal Income at the regional level to calculate output/income ratio for years 1995–2003 are the main criteria for the specification of the regions. By considering this constraint, we make the following changes to the original NUTS1 and NUTS2 specification:

NUTS1:

We delete the FR9 region, which is the overseas French region. Due to the availability of data, we also exclude Luxembourg. Total number of NUTS1 regions we have in our dataset is 70. A list of the regions in the dataset is given at the end of this section.

NUTS2:

4 NUTS2 regions that are part of the FR9 NUTS1 region and Luxembourg is deleted from the NUTS2 level data. Another important aspect here is the missing data for NUTS2 regions. Each NUTS1 region consists of a number of NUTS2 sub-regions. In the case of missing data to calculate initial output between 1991-1994 or output/income ratio between 1995-2003 for NUTS2 regions, we do the following specifications to organize NUTS2 level data.

First, if we don't have any data for NUTS2 regions of a particular NUTS1 region, we drop these NUTS2 regions and use the data for the NUTS1 region which contains these NUTS2 regions. Those regions are as follows:

DE4 = DE41+DE42 (Brandenburg = Brandenburg Nordost + Brandenburg - Südwest)
DEA = DEA1+ DEA2+ DEA3+ DEA4+ DEA5 (Nordrhein-Westfalen = Düsseldorf + Köln + Münster + Detmold + Arnsberg)
DED = DED1+ DED2+ DED3 (Sachsen = Chemnitz + Dresden + Leipzig)
IE0 = IE01+ IE02 (Ireland = Border, Midlands and Western + Southern and Eastern)

FI1 = FI13+FI18+FI19+FI1A (Manner-Suomi = Itä-Suomi + Etelä-Suomi + Länsi-Suomi +Pohjois-Suomi)
PT1 = PT11+PT15+PT16+PT17+PT18 (Continente = Norte + Centro + Lisboa + Alentejo + Algarve)
UKI = UKI1+UKI2 (London= Inner London + Outer London)
UKL = UKL1+UKL2 (Wales = West Wales and The Valleys + East Wales)
UKM = UKM1 + UKM2 + UKM3 + UKM4 (Scotland = North Eastern Scotland+ Eastern Scotland + South Western Scotland + Highlands and Islands)

Secondly, another specification is done when we do not have data for some of the NUTS2 sub-regions of a NUTS1 region, but we have the data for the corresponding NUTS1 region. We drop the NUTS2 regions with missing data and define a new region as the "rest of the NUTS1 region." 3 regions are defined as follows:

Rest of ES6 or **(ES63+ ES64)** = ES6 - ES61 -ES62
(Ciudad Autónoma de Ceuta (ES) + Ciudad Autónoma de Melilla (ES))
Rest of ITD or **(ITD1+ ITD2)** = ITD - ITD3 - ITD4 - ITD5
(Provincia Autonoma Bolzano-Bozen + Provincia Autonoma Trento)
Rest of SE0 or **(SE09+ SE0A)** = SE0 - SE01 - SE02- SE04 - SE06 - SE07 - SE08
(Småland med öarna + Västsverige)
After these changes, the total number of NUTS2 regions we have in our data set is 185.

Gross Regional Product: GRP is Gross Regional Product for NUTS1 and NUTS2 regions. This data is collected from two sources. The first part is received from the internal Eurostat database by request, and contains the 1991-1994 period according to the ESA79 system,[45] which we use to calculate the initial output for the 1991-1994 period. After 1995,

[45]In the European System of Accounts ESA79 takes 1979 and ESA95 takes 1995 as the reference year in the national accounts.

data is published according to ESA95 standards and available as a public database. Data is reported in ECU until 1998 and after 1999 all series are in Euros.

Gross Domestic Product: Collected from the same sources as regional level GDP data to calculate the GDP/GNI ratio. We use real per capita GDP series at constant 2000 US dollars for initial output and initial growth calculations for country level regressions.

Gross National Income: GNI at the country level is taken from the Eurostat database to calculate the output/income ratio for 1995-2003.

Regional Personal Income: RPI is the income of households for NUTS1 and NUTS2 regions. We use the term personal income but more precisely we use what is called "Primary Income" in the dataset. Primary income is the compensation of employees received plus mixed income (or the operating surplus from their own-account production of housing services) of resident households, plus property income received minus property income payable by resident households. Note that primary income differs from the usual definition of personal income which usually includes transfers.

Regional Personal Disposable Income: We construct an "Intermediate Income" level as $primary\ income\ -\ taxes$. "Disposable income" is the income level after taxes and transfers which is $primary\ income\ -\ taxes\ +\ transfers$.

Population: Annual average population data from Eurostat.

Total Value Added: Gross value added at basic prices series is used.

Sector Shares: 1995 is taken as the initial year to compute the sector shares. We have a full set of data on sectoral activity for NUTS1 regions, but data is not complete for NUTS2 re-

gions. The International Standard Industrial Classification of All Economic Activities(ISIC) is the international standard for classification by economic activities. It is used to classify each enterprise according to its primary activity. The primary activity is defined in that activity that generates the most value added. NACE[46] is the compatible EU equivalent. Eurostat uses NACE classification to report sectoral data. NACE classification for sectors is reported in the table. Sectors we used for the regressions are as follows:

Agriculture share: Ratio of "A B Agriculture, hunting, forestry and fishing" NACE branch to the total value added from the Eurostat database. Data for all regions are available in NUTS1, NUTS2 and country level.

Mining share: Ratio of "C Mining and Quarrying" NACE branch to the total value added from the Eurostat database. Data for Denmark and Germany data are missing at the NUTS1, NUTS2, and country levels.

Manufacturing: Ratio of "D Manufacturing" NACE branch to the total value added from the Eurostat database. Data for Denmark and Germany data are missing at the NUTS1, NUTS2, and country levels.

Finance: Ratio of "J Financial Intermediation" NACE branch to the total value added from the Eurostat database. Data for Denmark and Germany data are missing at the NUTS1, NUTS2, and country levels.

Retirement: The share of population over age 65 is used. Average of the years 1992-1994 are used due to availability of data. All regions are available in NUTS1 and country level, Germany, Ireland, Finland and ukk3 (Cornwall and Isles of Scilly) and ukk4 (Devon) regions from UK is missing at the NUTS2 level.

[46]Nomenclature générale des Activités Economiques dans les Communautés Européenes– - General Industrial Classification of Economic Activities within the European Communities

Migration: Net migration is calculated by subtracting the departures from the arrivals. We use the internal migration which is the movements within the country. When we sum up net migration of the regions for a particular country we find zero. Data is not available for Denmark, Germany, Greece, France, Ireland, Portugal, Finland and ukk3 (Cornwall and Isles of Scilly) and ukk4 (Devon) regions from UK. We use the 1992-1994 average share of population who migrated over 1992-1994 by excluding these missing regions.

7.3 Country Level Data

Net assets: Data is based on Lane and Milesi-Ferretti (2006) dataset. Assets and liabilities are available under the categories of portfolio equities, foreign direct investment, debt and financial derivatives. Total liabilities is the sum of these categories. Total assets include total reserves besides these assets. Net assets are the difference between the total assets and total liabilities of the particular country, and they enter the regressions as a ratio of GDP.

Current Account: The current account balance is the sum of net exports of goods and services, income, and current transfers. Data is from the World Development Indicators, reported in terms of current US dollars.

GDP and GNI data at country level for these regressions are also collected from WDI dataset.

Property Rights Institutions: The data source is the ICRG variables from the PRS Group. The ICRG model for forecasting financial, economic, and political risk was created in 1980 by the editors of "International Reports," a weekly newsletter on international finance and economics. The editors created a statistical model to calculate country risks, which later turned into a comprehensive system that enables measuring and comparing various types of

country level economic and political risks. In 1992, ICRG (its editor and analysts) moved from "International Reports" to "The PRS Group." Now, "The PRS Group" professional staff assigns scores for each category to each country. We use the average of 1991-1994 data.

No Corruption: Assessment of corruption within the political system. Average yearly rating from 0 to 6, where a higher score means lower risk.

Law and Order: The Law sub-component is an assessment of the strength and impartiality of the legal system; the Order sub-component is an assessment of popular observance of the law. Average yearly rating from 0 to 6, where a higher score means lower risk.

Government Stability: The government's ability to carry out its declared program(s), and its ability to stay in office. Average yearly rating from 0 to 12, where a higher score means lower risk.

Bureaucratic Quality: Institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change. Average yearly rating from 0 to 4, where a higher score means lower risk.

No Expropriation Risk: This is an assessment of factors affecting the risk to investment that are not covered by other political, economic and financial risk components. It is the sum of three subcomponents, each with a maximum score of 4 points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk. The subcomponents are: Contract Viability/Expropriation, Profits Repatriation, Payment Delays.

Legal System Regulations:

Total duration of checks collection: Data is based on the calculations of Djankov et al.

(2003). The total estimated duration in calendar days of the procedure under the factual and procedural assumptions provided. It is the sum of: (i) duration until completion of service of process, (ii) duration of trial, and (iii) duration of enforcement.

Duration of enforcement: Data is based on the calculations of Djankov et al. (2003). Duration of enforcement (from notification to actual enforcement) is the estimated duration, in calendar days, between the moment of issuance of judgement and the moment the landlord repossesses the property (for the eviction case) or the creditor obtains payment (for the check collection case).

Formalism index: Data is based on the calculations of Djankov et al. (2003). The index measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts, and is formed by adding up the following indices: (i) professionals vs. laymen, (ii) written vs. oral elements, (iii) legal justification, (iv) statutory regulation of evidence, (v) control of superior review, (vi) engagement formalities, and (vii) independent procedural actions. The index ranges from 0 to 7, where 7 means a higher level of control or intervention in the judicial process.

Enforceability of contracts: Data is based on the calculations of Djankov et al. (2003). The relative degree to which contractual agreements are honored and complications presented by language and mentality differences. Scale for 0 to 10, with higher scores indicating higher enforceability.

Creditor Rights: Data is based on the calculations of La Porta et al. (2006). An index aggregating different creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions, such as creditors consent or minimum dividends to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) secured creditors are

ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm; and (4) the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4.

Shareholder Rights: Data is based on the calculations of La Porta et al. (2006). An index aggregating the shareholder rights which we labeled as anti-director rights. The index is formed by adding 1 when: (1) the country allows shareholders to mail their proxy vote to the firm; (2) shareholders are not required to deposit their shares prior to the General Shareholders Meeting; (3) cumulative voting or proportional representation of minorities in the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders Meeting is less than or equal to 10 percent (the sample median); or (6) shareholders have preemptive rights that can only be waved by a shareholders vote. The index ranges from 0 to 6.

Financial Regulations:

Disclosure requirements: Data is based on the calculations of La Porta et al. (2006). The index of disclosure equals the arithmetic mean of: (1) Prospect; (2) Compensation; (3) Shareholders; (4) Inside ownership; (5) Contracts Irregular; (6) and Transactions.

Liability standard: Data is based on the calculations of La Porta et al. (2006). The index of liability standards equals the arithmetic mean of: (1) Liability standard for the issuer and its directors; (2) Liability standard for the distributor; and (3) Liability standard for the accountant.

Public enforcement: Data is based on the calculations of La Porta et al. (2006). The index of public enforcement equals the arithmetic mean of: (1) Supervisor characteristics index; (2) Rule making power index; (3) Investigative powers index; (4) Orders index; and

(5) Criminal index.

Investor Protection: Data is based on the calculations of La Porta et al. (2006). Principal component of disclosure, liability standards, and Anti-director rights. Scale from 0 to 10.

Government ownership of banks: Data is based on the calculations of La Porta et al. (2006). Share of the assets of the top 10 banks in a given country owned by the government of that country in 1970 and 1995. The percentage of the assets owned by the government in a given bank is calculated by multiplying the share of each shareholder in that bank by the share the government owns in that shareholder, and then summing the resulting shares.

7.4 Individual Level Data from World Values Survey

The World Values Survey first emerged out of the European Values Study in 1981, when the methods of a successful European study were extended to 14 countries outside Europe. The 1981 study covered only 22 countries worldwide. After the extension of the survey around the world, it is coordinated by an organization of a network of social scientists, the World Values Survey Association.

World Values Surveys were designed to enable a cross-national, cross-cultural comparison of values and norms on a wide variety of topics and to monitor changes in values and attitudes across the globe. There are four waves of the World Values Survey carried out 1981-1984, 1990-1993, 1995-1997, and 1999-2004. We use the survey data from the second wave, surveys conducted 1990–1991, for our sample countries.

Broad topics covered including perception of life, family, work, traditional values, personal finances, religion and morale, the economy, politics and society, the environment, allocation of resources, contemporary social issues, national identity, and technology and its impact on society. All surveys are carried out through face-to-face interviews, with a sampling universe consisting of all adult citizens, ages 18 and older.

We use 15 questions from the survey. We construct a mixed sample of NUTS1 and NUTS2

regions considering the regional specification in World Values Survey. The Dataset uses NUTS1 regions for Germany, France, Portugal, UK, and NUTS2 regions for Belgium, Spain, Italy, Netherland, Austria to indicate the location of the individual. As explained below, we construct regional indices of confidence and trust. The following sections describe the survey questions and the construction of the indices used in the regressions.

Confidence Index:

Questions 1-11: Confidence Scale of 1 to 4, higher values indicate less confidence in the institution named in the question. The institution is armed forces in question 1; education system in question 2; press in question 3; labor unions in question 4; police in question 5; parliament in question 6; the civil services in question 7; the social security system in question 8; major companies in question 9; justice system in question 10 and the European Union in question 11.

We take the average of individual responses over the regions, and divide by the maximum value of the regional averages in our sample. Confidence index is constructed as multiplying the sum of these rescaled values of regional averages by $(-1/11)$. We reverse the sign in order to make the interpretation easier. For the final value of confidence index, higher values of confidence index indicates higher confidence.

"Core Confidence" index is constructed based on only questions 5, 8, and 9.

Trust Index:

Question 12 : Most people can be trusted Takes values 1 or 2, 1 means that individual trusts most people.

Questions 13: Trust: Other people in country Scale of 1 to 5, where lower values mean more trust.

Average of individual responses over the regions are divided by the maximum value in the

sample to rescale between 0 and 1. Trust index is constructed using these rescaled regional series by $-1/2 * (Q12 + Q13)$. For the final value of trust index, higher values of trust index indicates higher trust.

Due to data availability, we exclude Centre-Est and Northern Ireland regions from the sample and construct a sample of 105 regions to perform our analysis.

NACE Classification

A B	Agriculture, hunting, forestry and fishing
A	Agriculture, hunting and forestry
B	Fishing
C D E	Total industry (excluding construction)
C TO F	Industry
C	Mining and quarrying
D	Manufacturing
E	Electricity, gas and water supply
F	Construction
G TO P	Services
G H I	Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods; hotels and restaurants; transport, storage and communication
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants
I	Transport, storage and communication
J K	Financial intermediation; real estate, renting and business activities
J	Financial intermediation
K	Real estate, renting and business activities
L TO P	Public administration and defence, compulsory social security; education; health and social work; other community, social and personal service activities; private households with employed persons
L	Public administration and defence; compulsory social security
M	Education
N	Health and social work
O	Other community, social, personal service activities
P	Activities of households

List of Countries

BE	Belgium
DK	Denmark
DE	Germany
GR	Greece
ES	Spain
FR	France
IE	Ireland
IT	Italy
NL	Netherlands
AT	Austria
PT	Portugal
FI	Finland
SE	Sweden
UK	United Kingdom

List of NUTS1 Regions

BE	**Belgium(3 regions)**
BE1	Région de Bruxelles-Capitale
	Brussels Hoofdstedlijk Gewest
BE2	Vlaams Gewest
BE3	Région Wallonne
DK	**Denmark (1 region)**
DK0	Denmark
DE	**Germany (16 regions)**
DE1	Baden-Württemberg
DE2	Bayern
DE3	Berlin
DE4	Brandenburg
DE5	Bremen
DE6	Hamburg
DE7	Hessen
DE8	Mecklenburg-Vorpommern
DE9	Niedersachsen
DEA	Nordrhein-Westfalen
DEB	Rheinland-Pfalz
DEC	Saarland
DED	Sachsen
DEE	Sachsen-Anhalt
DEF	Schleswig-Holstein
DEG	Thüringen
GR	**Greece (4 regions)**
GR1	Voreia Ellada
GR2	Kentriki Ellada
GR3	Attiki
GR4	Nisia Aigaiou, Kriti
ES	**Spain (7 regions)**
ES1	Noroeste
ES2	Noreste
ES3	Comunidad de Madrid
ES4	Centro (ES)
ES5	Este
ES6	Sur
ES7	Canarias (ES)
FR	**France (8 regions)**
FR1	Île de France
FR2	Bassin Parisien
FR3	Nord - Pas-de-Calais
FR4	Est
FR5	Ouest
FR6	Sud-Ouest
FR7	Centre-Est
FR8	Méditerranée
IE	**Ireland (1 region)**
IE0	Ireland
IT	**Italy (5 regions)**
ITC	Nord Ovest
ITD	Nord Est
ITE	Centro (IT)
ITF	Sud (IT)
ITG	Isole (IT)
NL	**Netherlands (4 regions)**
NL1	Noord-Nederland
NL2	Oost-Nederland
NL3	West-Nederland
NL4	Zuid-Nederland
AT	**Austria (3 regions)**
AT1	Ostösterreich
AT2	Südösterreich
AT3	Westösterreich
PT	**Portugal (3 regions)**
PT1	Continente (PT)
PT2	Região Autónoma dos Açores (PT)
PT3	Região Autónoma da Madeira (PT)
FI	**Finland (2 regions)**
FI1	Manner-Suomi
FI2	Åland
SE	**Sweden (1 region)**
SE0	Sverige

List of NUTS1 Regions

UK	**United Kingdom (12 regions)**
UKC	North East
UKD	North West (including Merseyside)
UKE	Yorkshire and The Humber
UKF	East Midlands
UKG	West Midlands
UKH	Eastern
UKI	London
UKJ	South East
UKK	South West
UKL	Wales
UKM	Scotland
UKN	Northern Ireland

List of NUTS2 Regions

BE	**Belgium(11 regions)**
BE10	Région de Bruxelles-Capitale Brussels Hoofdstedlijk Gewest
BE21	Prov. Antwerpen
BE22	Prov. Limburg (B)
BE23	Prov. Oost-Vlaanderen
BE24	Prov. Vlaams Brabant
BE25	Prov. West-Vlaanderen
BE31	Prov. Brabant Wallon
BE32	Prov. Hainaut
BE33	Prov. Liège
BE34	Prov. Luxembourg (B)
BE35	Prov. Namur
DK	**Denmark (1 region)**
DK00	Denmark
DE	**Germany (34 regions)**
DE11	Stuttgart
DE12	Karlsruhe
DE13	Freiburg
DE14	Tübingen
DE21	Oberbayern
DE22	Niederbayern
DE23	Oberpfalz
DE24	Oberfranken
DE25	Mittelfranken
DE26	Unterfranken
DE27	Schwaben
DE30	Berlin
DE4	Brandenburg
DE50	Bremen
DE60	Hamburg
DE71	Darmstadt
DE72	Gießen
DE73	Kassel
DE80	Mecklenburg-Vorpommern
DE91	Braunschweig
DE92	Hannover
DE93	Lüneburg
DE94	Weser-Ems
DEA	Nordrhein-Westfalen
DEB1	Koblenz
DEB2	Trier
DEB3	Rheinhessen-Pfalz
DEC0	Saarland
DED	Sachsen
DEE1	Dessau
DEE2	Halle
DEE3	Magdeburg
DEF0	Schleswig-Holstein
DEG0	Thüringen
GR	**Greece (13 regions)**
GR11	Anatoliki Makedonia, Thraki
GR12	Kentriki Makedonia
GR13	Dytiki Makedonia
GR14	Thessalia
GR21	Ipeiros
GR22	Ionia Nisia
GR23	Dytiki Ellada
GR24	Sterea Ellada
GR25	Peloponnisos
GR30	Attiki
GR41	Voreio Aigaio
GR42	Notio Aigaio
GR43	Kriti
ES	**Spain (18 regions)**
ES11	Galicia
ES12	Principado de Asturias
ES13	Cantabria
ES21	Pais Vasco
ES22	Comunidad Foral de Navarra

List of NUTS2 Regions

ES23	La Rioja	**IT**	**Italy (20 regions)**
ES24	Aragón	ITC1	Piemonte
ES30	Comunidad de Madrid	ITC2	Valle d'Aosta/Valle d'Aoste
ES41	Castilla y León	ITC3	Liguria
ES42	Castilla-la Mancha	ITC4	Lombardia
ES43	Extremadura	ITD77 (ITD1+ITD2)	Rest of ITD
ES51	Cataluña	ITD3	Veneto
ES52	Comunidad Valenciana	ITD4	Friuli-Venezia Giulia
ES53	Illes Balears	ITD5	Emilia-Romagna
ES61	Andalucia	ITE1	Toscana
ES62	Región de Murcia	ITE2	Umbria
ES677 (ES63+ES64)	Rest of ES6	ITE3	Marche
ES70	Canarias (ES)	ITE4	Lazio
FR	**France (22 regions)**	ITF1	Abruzzo
FR10	Île de France	ITF2	Molise
FR21	Champagne-Ardenne	ITF3	Campania
FR22	Picardie	ITF4	Puglia
FR23	Haute-Normandie	ITF5	Basilicata
FR24	Centre	ITF6	Calabria
FR25	Basse-Normandie	ITG1	Sicilia
FR26	Bourgogne	ITG2	Sardegna
FR30	Nord - Pas-de-Calais	**NL**	**Netherlands (12 regions)**
FR41	Lorraine	NL11	Groningen
FR42	Alsace	NL12	Friesland
FR43	Franche-Comté	NL13	Drenthe
FR51	Pays de la Loire	NL21	Overijssel
FR52	Bretagne	NL22	Gelderland
FR53	Poitou-Charentes	NL23	Flevoland
FR61	Aquitaine	NL31	Utrecht
FR62	Midi-Pyrénées	NL32	Noord-Holland
FR63	Limousin	NL33	Zuid-Holland
FR71	Rhône-Alpes	NL34	Zeeland
FR72	Auvergne	NL41	Noord-Brabant
FR81	Languedoc-Roussillon	NL42	Limburg (NL)
FR82	Provence-Alpes-Côte d'Azur	**AT**	**Austria (9 regions)**
FR83	Corse	AT11	Burgenland
IE	**Ireland (1 region)**	AT12	Niederösterreich
IE0	Ireland	AT13	Wien

List of NUTS2 Regions

AT21	Kärnten
AT22	Steiermark
AT31	Oberösterreich
AT32	Salzburg
AT33	Tirol
AT34	Vorarlberg
PT	**Portugal (3 regions)**
PT1	Continente
PT20	Região Autónoma dos Açores (PT)
PT30	Região Autónoma da Madeira (PT)
FI	**Finland (2 regions)**
FI1	Manner-Suomi
FI20	Åland
SE	**Sweden (7 regions)**
SE01	Stockholm
SE02	Östra Mellansverige
SE04	Sydsverige
SE06	Norra Mellansverige
SE07	Mellersta Norrland
SE08	Övre Norrland
SE077 (SE09+SE0A)	Rest of SE0
UK	**United Kingdom (32 regions)**
UKC1	Tees Valley and Durham
UKC2	Northumberland, Tyne and Wear
UKD1	Cumbria
UKD2	Cheshire
UKD3	Greater Manchester
UKD4	Lancashire
UKD5	Merseyside
UKE1	East Riding and North Lincolnshire
UKE2	North Yorkshire
UKE3	South Yorkshire
UKE4	West Yorkshire
UKF1	Derbyshire and Nottinghamshire
UKF2	Leicestershire Rutland and Northants
UKF3	Lincolnshire Worcestershire and Warks
UKG1	Herefordshire
UKG2	Shropshire and Staffordshire
UKG3	West Midlands
UKH1	East Anglia
UKH2	Bedfordshire, Hertfordshire
UKH3	Essex
UKI	London
UKJ1	Berkshire, Bucks and Oxfordshire
UKJ2	Surrey, East and West Sussex
UKJ3	Hampshire and Isle of Wight
UKJ4	Kent
UKK1	Gloucestershire, Wiltshire and North Somerset
UKK2	Dorset and Somerset
UKK3	Cornwall and Isles of Scilly
UKK4	Devon
UKL	Wales
UKM	Scotland
UKN	Northern Ireland

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Table 1: **Descriptive Statistics for EU Countries**

Number of Observations	14
Average GDP/GNI, 1995–2003	1.02 (0.04)
GDP/GNI in 1995	1.01 (0.03)
Capital Inflows / GDP, 1995–2003 (%)	–3.15 (34.05)
Capital Inflows / GDP, 1991–1994 (%)	0.38 (8.62)
Avg. Net Assets/GDP, 1995–2003 (%)	–15.24 (25.86)
Average GDP, 1991–1994	19.67 (8.22)
Change in GDP/GNI Ratio from 1996 to 2003	0.22 (2.73)
GDP Growth, 1992–1994 (%)	0.77 (1.18)
Population Growth, 1992–1994 (%)	1.52 (0.70)
Property Rights Institutions, 1991–1994	0.31 (0.03)
Legal Regulations in 1999	0.31 (0.04)
Financial Regulations in 1999	0.31 (0.08)

Notes: Means and standard deviations (in parenthesis) are reported. GDP is Gross Domestic Product and GNI is Gross National Income. GDP/GNI is the ratio of those. Capital Inflows / GDP is the ratio of the sum of current account balance (sign reversed) to the average GDP over the given years. Net Assets/GDP is the ratio of the net asset position to the GDP, averaged between 1995 and 2003. Average GDP is in thousands of constant 2000 U.S. dollars averaged between 1991 and 1994. Growth rate of GDP is the cumulative growth in the real per capita GDP between 1992 and 1994. Population growth is the cumulative growth rate of population between 1992 and 1994. Institution and regulation variables are the principal component of each group of variables reported in Table 22, see data appendix for further details.

Table 2: **Descriptive Statistics for NUTS2 Regions**

	Belgium	Germany	Spain	France	Italy	Nether.	Austria	Portug.	Sweden	UK
Number of Regions	11	34	18	22	20	12	9	3	7	32
Avg. Out./Inc.	1.29	1.36	1.44	1.37	1.35	1.51	1.39	1.66	1.55	1.36
1995–2003	(0.48)	(0.15)	(0.02)	(0.06)	(0.03)	(0.22)	(0.21)	(0.18)	(0.09)	(0.14)
Avg. GRP	16.89	18.92	11.12	16.17	19.62	16.36	18.12	5.88	20.28	13.37
1991–1994	(4.18)	(6.49)	(2.00)	(2.99)	(20.31)	(2.49)	(4.86)	(1.12)	(2.26)	(1.99)
Chg. Out./Inc.	0.07	0.01	0.04	–0.04	0.12	0.04	0.02	0.13	–0.01	–0.01
1996–2003	(0.05)	(0.06)	(0.08)	(0.04)	(0.05)	(0.07)	(0.04)	(0.07)	(0.03)	(0.07)
GDP Growth (%)	5.77	8.32	–1.89	4.25	–2.77	5.24	6.22	5.66	–5.55	1.49
1992–1994	(0.93)	(6.80)	(0.71)	(0.80)	(0.84)	(1.30)	(0.80)	(1.05)	(0.52)	(0.88)
Agr. Share (%)	2.01	1.73	5.41	4.67	3.99	4.62	3.25	7.25	3.56	2.81
in 1995	(1.14)	(1.03)	(3.65)	(2.42)	(1.70)	(2.54)	(2.41)	(4.01)	(1.94)	(2.51)
Finance Share (%)	4.83	–	4.88	4.01	4.17	4.70	5.76	5.20	3.71	4.52
in 1995	(4.23)	–	(1.09)	(1.02)	(0.97)	(2.52)	(1.50)	(1.07)	(2.32)	(2.01)
Manuf. Share (%)	19.77	–	17.33	20.13	18.73	18.82	20.23	9.41	22.67	23.98
in 1995	(6.82)	–	(8.30)	(6.66)	(7.62)	(6.67)	(6.17)	(8.05)	(5.66)	(6.39)
Mining Share (%)	0.31	–	0.86	0.28	0.32	3.67	0.42	0.38	0.70	0.73
in 1995	(0.39)	–	(1.72)	(0.23)	(0.31)	(7.93)	(0.26)	(0.16)	(1.37)	(0.74)
Avg. Migrat.(%)	0.10	0.34	0.13	–	0.22	0.32	0.13	–	0.31	0.27
1992–1994	(0.15)	(0.41)	(0.15)	–	(0.39)	(0.79)	(0.16)	–	(0.38)	(0.34)
Avg. Retirem. (%)	15.13	15.17	14.89	15.50	16.59	13.01	14.31	12.94	17.82	15.95
1992–1994	(1.63)	(1.32)	(2.77)	(2.57)	(2.96)	(1.78)	(2.16)	(1.20)	(1.65)	(1.76)
Avg. Pop.	0.91	2.38	2.17	2.61	2.84	1.27	0.87	3.32	1.24	1.82
1991–1994	(0.44)	(2.88)	(2.04)	(2.19)	(2.28)	(0.97)	(0.51)	(5.32)	(0.74)	(1.28)
Trust	–0.89	–0.80	–0.84	–0.91	–0.91	–0.80	–0.81	–0.85	–	–0.82
	(0.04)	(0.04)	(0.05)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	–	(0.02)
Confidence	–0.83	–0.84	–0.84	–0.82	–0.85	–0.80	–0.80	–0.81	–	–0.83
	(0.01)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.00)	–	(0.02)

Notes: Means of the variables are reported (standard deviations in parenthesis). Avg. Out./Inc. is the ratio of regional gross domestic product (GRP) to regional personal income (RPI), averaged between 1995 and 2003. Avg. GRP 1991–1994 is GRP in thousands of ECU divided by population, averaged between 1991 and 1994. GDP growth is cumulative growth rate of per capita GDP, for 1992 and 1994. All the sector shares are the percentages of total value added in 1995. Avg. Migrat. is the absolute value of the net population movements within the given country as percent of the total population, averaged between 1992 and 1994. Avg. Retirm. is the share of population over age 65 as percent of the total population, averaged between 1992 and 1994. Avg. Pop. is population in millions of people, averaged between 1991 and 1994. Trust and Confidence indices are calculated using a mixed regional sample based on World Values Survey regional specification. We use the 1990–1991 wave of the survey. See data appendix for details.

Table 3: **Correlation Matrix for EU Countries**

	Δ GDP/GNI 96–03	GDP/GNI 95–03	GDP 91–94	CI/GDP 91–94	CI/GDP 95–03
Δ GDP/GNI 96–03	1.00				
GDP/GNI 95–03	0.61	1.00			
GDP 91–94	–0.50	–0.10	1.00		
CI / GDP 91–94	–0.37	–0.12	–0.28	1.00	
CI / GDP 95–03	0.29	–0.03	–0.81	0.30	1.00
NA/GDP 95–03	0.18	–0.01	0.26	–0.54	–0.06
Growth 92–94	0.44	0.55	0.32	–0.54	–0.17
Growth 95–03	0.67	0.83	–0.36	0.01	0.08
GDP/GNI 95	0.29	0.93	0.17	0.00	–0.25
Pop. Gr. 92–94	0.22	–0.09	-0.08	0.07	0.09

	NA/GDP 95–03	Growth 92–94	Growth 95–03	GDP/GNI 95	Pop. Gr. 92–94
NA/GDP 95–03	1.00				
Growth 92–94	0.52	1.00			
Growth 95–03	–0.21	0.34	1.00		
GDP/GNI 95	–0.06	0.49	0.68	1.00	
Pop. Gr. 92–94	–0.16	–0.29	0.14	–0.21	1.00

Notes: All variables are demeaned. See Table 1 for definitions. CI is Capital Inflows, NA is Net Assets. GDP/GNI, GDP 1991–1994, CI/GDP and NA/GDP are in logs.

Table 4: **Correlation Matrix for Pooled NUTS2 Regions**

	Out/Inc	GRP	AgrSh	FinSh	ManSh	MinSh	Ret	Mig
Out/Inc	1.00							
GRP	0.26	1.00						
AgrSh	–0.15	–0.32	1.00					
FinSh	0.43	0.23	–0.31	1.00				
ManSh	–0.11	–0.01	–0.12	–0.32	1.00			
MinSh	0.26	0.06	0.06	–0.16	–0.08	1.00		
Ret	–0.02	0.08	0.10	0.01	0.25	–0.01	1.00	
Mig	–0.29	–0.03	0.29	–0.23	–0.03	–0.06	–0.06	1.00

	Change in Ratio	Growth 92–94	Out/Inc 1995	Pop. Growth
Change in Ratio	1.00			
Growth	0.00	1.00		
Out/Inc 1995	–0.31	–0.17	1.00	
Pop. Growth	–0.24	–0.14	–0.07	1.00

Notes: The top panel reports correlations for level regressions. AgrSh is agriculture, FinSh is finance, ManSh is manufacturing, and MinSh is mining shares of total value added in 1995. Ret is Retirement and Mig is Migration. See Table 2 for the detailed definitions of the variables. All variables in this panel are in logs. The bottom panel reports correlations of variables in change regressions. Change in Ratio is the change in the Output/Income ratio between 1996 and 2003, Growth is the cumulative real per capita GDP growth between 1992 and 1994, Out/Inc 1995 is the output/income ratio in 1995, and Pop. Growth is the cumulative population growth between 1992 and 1994. All variables are demeaned.

Table 5: **Net Capital Income Flows, Net Assets and Current Account: Countries**

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.:	NA/GDP 95–03	NA/GDP 95–03	Out/Inc 95–03	Out/Inc 95–03	Out/Inc 95–03	Out/Inc 95–03
Countries	EU 14	EU 13	EU 14	EU 13	24 OECD	23 OECD
Ireland	Yes	No	Yes	No	Yes	No
CF / GDP	–2.49	–	–	–	–	–
1991-1994	(1.94)	–	–	–	–	–
CF / GDP	–	–2.50	–	–	–	–
1991-1994	–	(1.86)	–	–	–	–
CF / GDP	–	–	–0.05	–	0.10	–
1991-1994	–	–	(0.38)	–	(1.56)	–
CF / GDP	–	–	–	0.08	–	0.14
1991-1994	–	–	–	(2.46)	–	(4.27)
R^2	0.29	0.27	0.01	0.29	0.10	0.53

Notes: See Table 1 for the definition of the variables. t-statistics in parentheses. NA denotes net assets and CF denotes net capital flows defined as the ratio of sum of current account balance (sign reversed) to the average GDP over the given years. The OECD sample includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States. For the OECD sample, the Output/Income ratio has a mean of 1.013 with standard deviation of 0.037 and the CI/GDP ratio has a mean 0.015 with standard deviation 0.113.

Table 6: **Capital Flows: EU Countries**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	ΔOut/Inc 1996–2003	ΔOut/Inc 1996–2003	ΔOut/Inc 1996–2003	ΔOut/Inc 1996–2003	CF/GDP 1995–2003	CF/GDP 1995–2003	Out/Inc 1995–2003	Out/Inc 1995–2003
Countries	14	13	14	13	14	13	14	13
Ireland	Yes	No	Yes	No	Yes	No	Yes	No
GDP Growth	0.35	–0.12	0.35	–0.18	–	–	–	–
1992–1994	(1.15)	(0.49)	(1.68)	(1.60)	–	–	–	–
Population Growth	–	–	1.57	0.06	–	–	–	–
1992–1994	–	–	(1.56)	(0.13)	–	–	–	–
Output/Income	–	–	0.13	–0.84	–	–	–	–
in 1995	–	–	(0.53)	(4.71)	–	–	–	–
GDP Growth	–	–	–	–	–0.14	1.48	–	–
1995–2003	–	–	–	–	(0.12)	(0.22)	–	–
Log Average GDP	–	–	–	–	–	–	–0.02	0.00
1991–1994	–	–	–	–	–	–	(0.70)	(0.11)
R^2	0.18	0.03	0.36	0.68	0.00	0.01	0.02	0.00

Notes: See Table 1 for the definition of the variables. t-statistics in parentheses. NA denotes net assets and CF denotes net capital flows defined as the ratio of sum of current account balance (sign reversed) to the average GDP over the given years.

Table 7: **Net Capital Income Flows: Pooled NUTS2 Regions**

	(1)	(2)	(3)	(4)
Specification	Changes	Changes	Levels	Levels
Number of Regions	168	168	168	168
IGrowth	–	0.14	–	–
	–	6.14	–	–
IOut * North1	–	–	–	1.07
	–	–	–	(5.70)
IOut * North2	–	–	–	0.21
	–	–	–	(4.90)
IOut * South	–	–	–	0.01
	–	–	–	(1.99)
IGrowth / IOut * Belgium	0.02	–	1.16	–
	(0.08)	–	(4.73)	–
IGrowth / IOut * Germany	0.13	–	0.15	–
	(6.16)	–	(3.20)	–
IGrowth / IOut * Spain	0.64	–	0.00	–
	(1.09)	–	(–0.15)	–
IGrowth / IOut * France	–0.10	–	0.23	–
	(0.32)	–	(10.60)	–
IGrowth / IOut * Italy	0.29	–	0.01	–
	(1.16)	–	(2.55)	–
IGrowth / IOut * Netherland	0.70	–	0.89	–
	(2.03)	–	(7.22)	–
IGrowth / IOut * Austria	0.29	–	0.56	–
	(0.84)	–	(11.91)	–
IGrowth / IOut * Portugal	1.25	–	–0.15	–
	(3.92)	–	(0.65)	–
IGrowth / IOut * Sweden	–0.61	–	0.34	–
	(2.61)	–	(2.80)	–
IGrowth / IOut * UK	0.08	–	0.32	–
	(0.22)	–	(3.82)	–
R^2	0.49	0.48	0.68	0.64

Notes: Change regressions use the change in the Output/Income ratio between 1996 and 2003 while level regressions use the log average output/income ratio between 1995 and 2003 as the dependent variable. IGrowth is the cumulative growth rate of per capita GDP between 1992 and 1994, used in the change regressions and IOut is the logarithm of average GDP between 1991 and 1994 used in the level regressions. Country names and group names correspond to dummy variables. The group North1 consist of the Netherlands and Belgium; North2 consists of Germany, France, Austria, Sweden, and the UK; while South includes Spain, Italy, and Portugal. Greece is excluded from the sample. t-statistics in parentheses. For change regressions, to test if the coefficients for all countries can be accepted statistically to be identical, the F-statistic is 0.75 whereas the 5 percent critical value of the F(148,9) distribution is 1.94, implying that this hypothesis is not rejected. For level regressions, we perform similar tests, and we can not reject the hypothesis of having 3 slopes, with an F-test value of 2.00. The F(148,7) 5 percent critical value is 2.07.

Table 8: **Change in Net Capital Income Flows: Pooled NUTS2 Regions**

Dependent Variable: Change in Output/Income, 1996–2003			
	(1)	(2)	(3)
Number of Regions	168	168	168
Country dummies	Yes	Yes	Yes
IGrowth	0.14	0.11	0.07
	(6.14)	(2.66)	(1.57)
Population Growth	–	–0.33	–0.49
from 1992 to 1994	–	(1.32)	(1.73)
Output/Income	–	–	–0.07
in 1995	–	–	(1.43)
R^2	0.47	0.47	0.49

Notes: Greece is excluded from the sample. t-statistics in parentheses. Regressions include country dummies. IGrowth is the cumulative growth rate of per capita GDP between 1992 and 1994. See Table 2 for definitions.

Table 9: **Correlation Matrix for Mixed Sample**

	Change in Ratio	Confidence	Trust	Conf*IGrowth	Trust*IGrowth	IGrowth
Change in Ratio	1.00					
Confidence	–0.34	1.00				
Trust	–0.28	0.22	1.00			
Confidence*IGrowth	0.19	0.09	–0.20	1.00		
Trust*IGrowth	0.33	–0.27	–0.19	–0.11	1.00	
IGrowth	–0.18	0.07	0.37	–0.57	0.24	1.00
Out/Inc 1995–2003	–0.09	0.01	0.13	0.06	–0.09	–0.10
Confidence*IOut	–0.27	0.12	0.12	–0.34	0.05	0.30
Trust*IOut	–0.15	0.15	–0.02	0.03	0.02	–0.16
N1*IOut	0.03	0.07	0.06	0.00	–0.08	0.11
N2*IOut	–0.38	0.16	0.06	0.25	–0.28	–0.19
IOut	–0.29	–0.05	0.04	0.21	–0.12	0.01

	Out/Inc 1995–2003	Conf*IOut	Trust*IOut	N1*IOut	N2*IOut	IOut
Out/Inc 1995–2003	1.00					
Confidence*IOut	–0.02	1.00				
Trust*IOut	0.01	0.36	1.00			
N1*IOut	0.51	0.09	–0.08	1.00		
N2*IOut	0.29	–0.05	0.38	–0.07	1.00	
IOut	0.19	–0.25	-0.04	0.27	0.58	1.00

Notes: We report the correlations for a mixed sample of NUTS1 and NUTS2 regions. Trust and Confidence are indices constructed using the World Values Survey questions. See the data appendix for further details. We use log transformed indices. IGrowth is the cumulative growth rate of per capita GDP between 1992 and 1994. IOut is the logarithm of average GDP between 1991 and 1994. N1 is the North1 and N2 is the North2 group of countries. North1 includes the Netherlands and Belgium; North2 consists of Germany, France, Austria and the UK while the South group is the countries of Portugal, Spain, and Italy. Out/Inc 1995–2003 is the logarithm of the output/income ratio averaged between 1995 and 2003. Change in Ratio is the change in the output/income ratio from 1996 to 2003.

Table 10: **Change in Net Capital Income Flows and Regional Social Capital: I**

Dependent Variable: Change in Output/Income Ratio, 1996–2003

	(1)	(2)	(3)	(4)	(5)	(6)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	107	105	105	107	105	105
Confidence	–	–0.03	–	–	–0.03	–
	–	(1.67)	–	–	(1.66)	–
Trust	–	–	0.00	–	–	0.00
	–	–	(0.66)	–	–	(0.64)
Confidence * IGrowth	–	0.24	–	–	0.23	–
	–	(3.42)	–	–	(3.40)	–
Trust * IGrowth	–	–	0.06	–	–	0.06
	–	–	(1.80)	–	–	(1.92)
IGrowth	0.14	0.19	0.12	0.11	0.16	0.08
	(6.04)	(5.85)	(5.21)	(3.22)	(3.89)	(2.40)
Population Growth	–	–	–	–0.33	–0.23	–0.32
from 1992 to 1994	–	–	–	(1.68)	(1.11)	(1.57)
Output/Income	–	–	–	–0.02	–0.02	–0.02
in 1995	–	–	–	(0.57)	(0.46)	(0.54)
R^2	0.65	0.68	0.64	0.65	0.68	0.65

Notes: IGrowth is the cumulative growth rate of per capita gross domestic product between 1992 and 1994. Country dummies are included in all regressions. t-statistics in parentheses. The sample is constructed using the regional specification in World Values Survey. We use the 1990-1991 wave of the survey. The dataset uses NUTS1 regions for Germany, France, Portugal, and the UK and NUTS2 regions for Belgium, Spain, Italy, the Netherlands, and Austria. The pooled sample excludes Greece and Sweden. See data appendix for detailed description of variables that compose the indices. We use log transformed values of the indices for regressions. The demeaned log confidence index has a standard deviation of 0.19, a maximum value of 0.43, and a minimum value of –0.55. The demeaned log trust index has a standard deviation of 0.47, a maximum value of 0.79, and a minimum value of –1.81.

Table 11: **Change in Net Capital Income Flows and Regional Social Capital: II**

Dependent Variable: Change in Output/Income Ratio, 1996–2003		
	(1)	(2)
Country dummies	Yes	Yes
Number of Observations	105	105
Confidence	–0.03	–0.03
	(1.70)	(1.68)
Trust	0.00	0.00
	(0.35)	(0.34)
Confidence * IGrowth	0.22	0.21
	(2.94)	(2.85)
Trust * IGrowth	0.03	0.03
	(0.78)	(0.85)
IGrowth	0.17	0.14
	(4.16)	(2.80)
Population Growth	–	–0.23
from 1992 to 1994	–	(1.13)
Output/Income	–	–0.02
in 1995	–	(0.46)
R^2	0.68	0.68

Notes: IGrowth is the cumulative growth rate of per capita gross domestic product between 1992 and 1994. We use log transformed values of indices for regressions. Country dummies are included in all regressions. t-statistics in parentheses. See Table 10 for further details.

Table 12: **The Role of Social Capital: Robustness**

Dependent Variable: Change in Output/Income Ratio, 1996–2003

	(1)	(2)	(3)	(4)	(5)
Core Confidence	–0.02	–	–	–	–
	(1.18)	–	–	–	–
Confidence	–	–0.03	–0.03	–	–
	–	(1.68)	(1.66)	–	–
Core Confidence * IGrowth	0.12	–	–	–	–
	(3.25)	–	–	–	–
Confidence * IGrowth	–	0.22	0.24	–	–
	–	(3.39)	(3.14)	–	–
Trust	–	–	–	0.00	0.00
	–	–	–	(0.31)	(0.66)
Trust * IGrowth	–	–	–	0.07	0.06
	–	–	–	(1.96)	(1.81)
IGrowth	0.19	0.28	0.18	0.33	0.11
	(5.29)	(1.68)	(2.05)	(1.96)	(1.42)
$IGrowth^2$	–	–0.13	–	–0.29	–
	–	(0.66)	–	(1.35)	–
IOut	–	–	–0.01	–	0.00
	–	–	(0.37)	–	(0.22)
IOut * IGrowth	–	–	0.01	–	–0.03
	–	–	(0.06)	–	(0.30)
R^2	0.67	0.68	0.68	0.65	0.64

Notes: IGrowth is the cumulative growth rate of per capita GDP between 1992 and 1994. IOut is the logarithm of average GDP between 1991 and 1994. We use log transformed values of the indices. Column (1) uses a core confidence index, constructed using confidence in parliament, major companies, and the justice system. Other columns are based on the confidence index using all 11 confidence questions, described in data appendix. Country dummies are included in all regressions. t-statistics in parentheses. See Table 10 for further details.

Table 13: **Correlation Matrix for Institutions**

	Change in Ratio	PRI*IGrowth	LR*IGrowth	FR*IGrowth	IGrowth	Out/Inc 1995–2003
Change in Ratio	1.00					
PRI*IGrowth	0.49	1.00				
LR*IGrowth	0.43	0.85	1.00			
FR*IGrowth	–0.02	–0.24	–0.44	1.00		
IGrowth	–0.01	–0.22	–0.24	0.72	1.00	
Out/Inc 1995–2003	–0.02	–0.10	–0.07	–0.11	–0.16	1.00
PRI*IOut	–0.08	0.01	–0.03	–0.04	–0.05	0.13
LR*IOut	0.00	0.02	0.07	–0.04	0.03	0.02
FR*IOut	–0.15	–0.17	–0.14	–0.26	–0.28	0.16
N1*IOut	0.06	–0.05	–0.02	–0.06	0.07	0.50
N2*IOut	–0.22	–0.14	–0.02	–0.37	–0.26	0.33
IOut	–0.14	–0.10	0.05	–0.24	–0.07	0.21

	PRI*IOut	LR*IOut	FR*IOut	N1*IOut	N2*IOut	IOut
PRI*IOut	1.00					
LR*IOut	0.89	1.00				
FR*IOut	–0.37	–0.59	1.00			
N1*IOut	0.05	–0.01	–0.04	1.00		
N2*IOut	0.12	0.05	0.49	–0.03	1.00	
IOut	–0.58	–0.59	0.53	0.20	0.62	1.00

Notes: Change in Ratio is the change in Output/Income ratio between 1996 and 2003 and Out/Inc 1995–2003 is the logarithm of the average output/income ratio between 1995 and 2003. IGrowth is the cumulative growth rate of per capita GDP between 1992 and 1994, and IOut is the logarithm of average GDP between 1991 and 1994. N1 is the North1 dummy for regions of the Netherlands and Belgium; N2 is the North2 dummy for Germany, France, Austria, Sweden, and the UK. The principal component for each group of variables reported in Table 22 is interacted with initial growth and initial output. PRI denotes property rights institutions, LR denotes legal regulations and FR is financial regulations. See data appendix for details. All variables are demeaned.

Table 14: **Change in Net Capital Income Flows and Country Institutions**

Dependent Variable: Change in Output/Income Ratio, 1996–2003				
	(1)	(2)	(3)	(4)
C dummies	Yes	Yes	Yes	Yes
N of Obs	168	168	168	168
PRI*IGrowth	–	–0.04	–	–
	–	(-0.02)	–	–
LR*IGrowth	–	–	0.27	–
	–	–	(0.15)	–
FR*IGrowth	–	–	–	–1.00
	–	–	–	(0.72)
IGrowth	0.14	0.14	0.14	0.23
	(6.14)	(5.00)	(5.62)	(1.75)
R^2	0.47	0.47	0.47	0.47

Notes: Principal component for each group of variables reported in Table 22 are used in the regressions. We use property rights institutions in column (2), legal regulations in column (3), and financial regulations in column (4). IGrowth is the cumulative growth rate of per capita gross domestic product between 1992 and 1994. Greece is excluded from the sample. Country dummies are included in all regressions. t-statistics in parentheses.

Table 15: **Net Capital Income Flows and Regional Social Capital**

Dependent Variable: Log of Output/Income Ratio 1995–2003

	(1)	(2)	(3)	(4)	(5)
C dummies	Yes	Yes	Yes	Yes	Yes
N of Obs	105	105	105	105	105
Confidence	–	–0.01	–0.06	–	–
	–	(0.16)	(1.51)	–	–
Confidence*IOut	–	0.53	0.03	–	–
	–	(2.40)	(0.40)	–	–
Trust	–	–	–	0.00	–0.04
	–	–	–	(0.07)	(1.70)
Trust*IOut	–	–	–	0.05	–0.10
	–	–	–	(0.32)	(1.38)
IOut*N1	1.06	-	1.05	-	1.08
	(5.67)	-	(5.53)	-	(6.75)
IOut*N2	0.22	-	0.23	-	0.27
	(4.28)	-	(4.71)	-	(4.89)
IOut	0.01	0.21	0.00	0.16	–0.02
	(0.87)	(3.34)	(0.02)	(3.39)	(1.06)
R^2	0.74	0.39	0.75	0.34	0.76

Notes: IOut is the logarithm of average GDP between 1991 and 1994. We use log transformed values of indices for regressions. See Table 10 for details. The pooled sample excludes Greece and Sweden. N1 is North1, and N2 is North2 group of countries. The North1 group includes the Netherlands and Belgium, the North2 group Germany, France, Austria, and the UK and the South group includes Portugal, Spain, and Italy. Country dummies are included in all regressions. t-statistics in parentheses.

Table 16: **Net Capital Income Flows and Country Institutions: I**

Dependent Variable: Log of Output/Income Ratio 1995–2003						
	(1)	(2)	(3)	(4)	(5)	(6)
N of Obs	168	168	168	168	168	168
PRI*IOut	1.48	1.00	–	–	–	–
	(5.38)	(1.60)	–	–	–	–
LR*IOut	–	–	1.29	–0.31	–	–
	–	–	(4.94)	(0.89)	–	–
FR*IOut	–	–	–	–	–0.49	–0.22
	–	–	–	–	(0.94)	(0.57)
IOut*N1	-	0.85	-	1.09	-	1.05
	-	(3.20)	-	(5.35)	-	(5.37)
IOut*N2	-	0.01	-	0.24	-	0.20
	-	(0.04)	-	(3.44)	-	(5.09)
IOut	0.26	0.18	0.23	–0.03	0.16	0.02
	(5.23)	(1.70)	(5.10)	(0.64)	(3.26)	(1.16)
R^2	0.46	0.64	0.38	0.64	0.31	0.64

Notes: Principal component for each group of variables reported in Table 22 are used in the regressions. We use property rights institutions in columns (1)-(2), legal regulations in columns (3)-(4), and financial regulations in columns (5)-(6)6. The sample is the pooled NUTS2 regions excluding Greece. N1 is the North1 and N2 is the North2 group of countries. The North1 group includes Belgium and the Netherlands while the North2 group includes Germany, France, Austria, Sweden, and the UK. IOut is the logarithm of average per capita GDP between 1991 and 1994. Country dummies are included in all regressions. t-statistics in parentheses.

Table 17: **Net Capital Income Flows and Country Institutions: II**

Dependent Variable: Log of Output/Income Ratio 1995–2003

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N of Obs	168	168	168	168	168	168	168	168	168	168
Inst	NoCorr	NoCorr	LawOrd	LawOrd	GStab	GStab	BQual	BQual	No-Exp	No-Exp
Inst*IOut	1.20	–1.66	5.51	3.78	2.06	1.14	3.52	0.50	2.91	1.86
	(4.38)	(2.58)	(4.69)	(2.37)	(6.41)	(2.97)	(4.39)	(0.95)	(5.76)	(3.75)
IOut*N1	-	1.33	-	0.74	-	0.89	-	1.02	-	0.83
	-	(5.51)	-	(3.19)	-	(4.16)	-	(5.34)	-	(3.81)
IOut*N2	-	0.50	-	–0.02	-	0.06	-	0.16	-	0.02
	-	(3.96)	-	(0.16)	-	(0.83)	-	(2.82)	-	(0.27)
IOut	0.22	–0.23	0.30	0.22	0.28	0.15	0.20	0.04	0.26	0.17
	(4.66)	(2.41)	(5.16)	(2.47)	(5.90)	(3.12)	(4.74)	(1.45)	(5.63)	(3.92)
R^2	0.40	0.65	0.51	0.65	0.47	0.65	0.43	0.64	0.49	0.66

Notes: The sample is the pooled NUTS2 regions excluding Greece. NoCorr is No-Corruption, LawOrd is Law and Order, GStab is government stability, BQual is Bureaucratic Quality, and No-Exp is No Expropriation Risk variable. See the data appendix for details on these variables. N1 is the North1 and N2 is the North2 group of countries. The North1 group includes Belgium and the Netherlands while the North2 group includes Germany, France, Austria, Sweden, and the UK. IOut is the logarithm of average per capita GDP between 1991 and 1994. Country dummies are included in all regressions. t-statistics in parentheses.

Table 18: **Net Capital Income Flows and Industrial Structure**

Dependent Variable: Log of Output/Income Ratio 1995–2003				
	(1)	(2)	(3)	(4)
Sector	Agr	Fin	Man	Min
Country dummies	Yes	Yes	Yes	Yes
N of Obs	134	134	134	134
Sector Share	–1.75	–0.43	–0.22	–0.20
	(3.75)	(0.56)	(1.08)	(0.37)
Sector Share *IOut	–3.60	8.93	–1.40	3.52
	(1.89)	(4.44)	(1.87)	(2.70)
IOut	0.07	0.09	0.11	0.13
	(2.18)	(2.98)	(2.53)	(2.75)
R^2	0.41	0.58	0.37	0.35

Notes: The sample is the pooled NUTS2 regions excluding Greece. German data for sector shares are not available and Germany is excluded from sample. Agr is the agriculture, Fin the Finance, Man the manufacturing, and Min the mining sector shares. Sector shares are log transformations of the ratio of the sector value added to total value added in 1995. IOut is the logarithm of average per capita GDP between 1991 and 1994. Country dummies are included in all regressions. t-statistics in parentheses.

Table 19: **Net Capital Income Flows and Industrial Structure: NORTH 1**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Out/Inc I	Out/Inc I	Out/Inc II	Out/Inc II	Out/Inc III	Out/Inc III
Regions	23	23	23	23	23	23
Log Avg. GRP	1.07	0.56	1.10	0.44	1.10	0.71
1991–1994	(5.71)	(3.67)	(5.59)	(2.99)	(6.60)	(10.67)
Log Fin. Share	–	4.36	–	5.02	–	3.62
in 1995	–	(3.78)	–	(4.54)	–	(4.83)
Log Man. Share	–	0.84	–	0.98	–	0.43
in 1995	–	(2.12)	–	(2.72)	–	(2.00)
Log Min. Share	–	1.43	–	1.71	–	0.85
in 1995	–	(3.50)	–	(4.37)	–	(3.34)
Log Agr. Share	–	0.66	–	–0.42	–	–0.12
in 1995	–	(0.59)	–	(0.36)	–	(0.19)
Log Avg. Retirement	–	1.26	–	1.31	–	–0.19
1992–1994	–	(1.66)	–	(1.67)	-	(0.35)
Log Avg. Migration	–	2.51	–	2.36	–	3.43
1992–1994	–	(0.63)	–	(0.59)	–	(1.40)
R^2	0.83	0.92	0.81	0.93	0.89	0.96

Notes: Sector shares are log transformations of the ratio of the sector value added to total value added in 1995. Migration is the ratio of net population movements within the given country to the total population, averaged between 1992 and 1994. Retirement is the ratio of population over age 65 to the total population, averaged between 1992 and 1994. The income measure is primary income for columns (1)-(2), intermediate income defined as primary income-taxes for columns (3)-(4), and disposable income defined as primary income-taxes+transfers for columns (5)-(6). The North1 sample consists of regions of Belgium and the Netherlands. Dummies for these countries included in all regressions. t-statistics in parentheses.

Table 20: **Net Capital Income Flows and Industrial Structure: NORTH 2**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Out/Inc I	Out/Inc I	Out/Inc II	Out/Inc II	Out/Inc III	Out/Inc III
Regions	46	46	46	46	46	46
Log Avg. GRP	0.41	0.48	0.42	0.53	0.63	0.60
1991–1994	(6.22)	(5.60)	(4.98)	(5.44)	(14.70)	(8.08)
Log Fin. Share	–	–1.73	–	–2.25	–	–0.84
in 1995	–	(1.51)	–	(1.81)	–	(1.08)
Log Man. Share	–	0.08	–	0.03	–	0.06
in 1995	–	(0.21)	–	(0.07)	–	(0.17)
Log Min. Share	–	–1.25	–	–0.17	–	–1.29
in 1995	–	(0.58)	–	(0.07)	–	(0.80)
Log Agr. Share	–	–0.46	–	–0.65	–	–0.68
in 1995	–	(0.71)	–	(0.95)	–	(1.53)
Log Avg. Retirement	–	0.27	–	0.84	–	–1.53
1992–1994	–	(0.32)	–	(0.88)	-	(2.86)
Log Avg. Migration	–	–13.31	–	–18.11	–	–6.73
1992–1994	–	(2.97)	–	(3.29)	–	(1.84)
R^2	0.36	0.55	0.33	0.56	0.65	0.80

Notes: Sector shares are log transformations of the ratio of the sector value added to total value added in 1995. Migration is the ratio of net population movements within the given country to the total population, averaged between 1992 and 1994. Retirement is the ratio of population over age 65 to the total population, averaged between 1992 and 1994. The income measure is primary income for columns (1)-(2), intermediate income defined as primary income-taxes for columns (3)-(4), and disposable income defined as primary income-taxes+transfers for columns (5)-(6). The North2 sample consists of Germany, France, Austria, Sweden and the UK. Retirement data for Cornwall, Isles of Scilly, and Devon of the UK are missing and these regions are excluded from the regressions. Regions of Germany and France are not included due to missing data. Country dummies countries included in all regressions. t-statistics in parentheses.

Table 21: **Net Capital Income Flows and Industrial Structure: SOUTH**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Out/Inc I	Out/Inc I	Out/Inc II	Out/Inc II	Out/Inc III	Out/Inc III
Regions	38	38	38	38	38	38
Log Avg. GRP	0.01	0.01	0.04	0.02	0.05	0.03
1991–1994	(2.33)	(3.52)	(3.11)	(2.19)	(2.28)	(1.84)
Log Fin. Share	–	–0.52	–	1.41	–	1.08
in 1995	–	(3.05)	–	(2.92)	–	(2.33)
Log Man. Share	–	–0.05	–	–0.03	–	0.30
in 1995	–	(1.29)	–	(0.30)	–	(2.99)
Log Min. Share	–	0.09	–	1.20	–	–1.20
in 1995	–	(0.92)	–	(6.32)	–	(5.27)
Log Agr. Share	–	–0.04	–	–0.44	–	–0.90
in 1995	–	(0.46)	–	(2.07)	–	(4.05)
Log Avg. Retirement	–	–0.20	–	0.02	–	–0.55
1992–1994	–	(1.68)	–	(0.10)	-	(2.11)
Log Avg. Migration	–	1.46	–	4.30	–	4.22
1992–1994	–	(3.37)	–	(4.65)	–	(1.84)
R^2	0.17	0.49	0.22	0.60	0.18	0.70

Notes: Sector shares are log transformations of the ratio of the sector value added to total value added in 1995. Migration is the ratio of net population movements within the given country to the total population, averaged between 1992 and 1994. Retirement is the ratio of population over age 65 to the total population, averaged between 1992 and 1994. The income measure is primary income for columns (1)-(2), intermediate income defined as primary income-taxes for columns (3)-(4), and disposable income defined as primary income-taxes+transfers for columns (5)-(6). The South sample consists of regions of Spain and Italy. Regions of Portugal are excluded due to missing data. Country dummies included in all regressions. t-statistics in parentheses.

Table 22: **Variables for the Principal Component Analysis (Appendix Table)**

PROPERTY RIGHTS INSTITUTIONS
No Corruption
Law and Order
Government Stability
Bureaucratic Quality
No Expropriation Risk
LEGAL REGULATIONS
Total duration of checks collection
Duration of enforcement
Formalism index
Enforceability of contracts
Creditor Rights
Shareholder Rights
FINANCIAL REGULATIONS
Disclosure requirements
Liability standard
Public enforcement
Investor Protection
Government ownership of banks in 1970
Government ownership of banks in 1995

Notes: See the data appendix for a description of variables.