The Real Effects of Financial Integration

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Abstract

Fluctuations in GDP are more synchronized internationally than fluctuations in Consumption, and they remain so even between financially integrated economies, where the ranking should in theory be the reverse. This paper shows that consumption patterns are more correlated between financially integrated economies. Thus the quantity puzzle must arise from the tendency of financially integrated economies to also display high GDP correlations. The paper shows this to be the case for economies with liberalized capital accounts, and, using a newly published dataset on actual bilateral capital flows, for economies with financial linkages intensive in long term assets. On the other hand, short term debt flows are associated with *lower* GDP correlations, consistent with theory. These results, rather than the lack of risk sharing in the data, are what constitutes the quantity puzzle.

Keywords: Quantity Puzzle, Financial Integration.

JEL Classification: F30, F41, E44

1 Introduction

In theory, consumption patterns between financially integrated regions should be more synchronized than production, for two reasons. First, capital flows follow returns differentials, which results in negative output correlations.[1] Second, agents consume out of a fully diversified portfolio wealth, resulting in perfectly correlated consumption plans. The overwhelming rejection of this ranking in the data was famously labelled a "quantity puzzle" by Backus, Kehoe and Kydland (1994). This paper shows the main reason for the anomaly lies in the response of output correlations to financial links, not in that of consumption.

There are two prominent and non exclusive explanations to the quantity puzzle.

Hypothesis A - Capital flows are restricted, effective diversification is limited and consumption plans remain largely idiosyncratic, and less correlated internationally than GDP fluctuations.

Hypothesis B - Capital flows are governed by motives reflective of imperfect information, and tend to herd rather than respond to differentials in returns. Thus, fluctuations in output can become more rather than less synchronized between financially integrated regions. This paper constructs a cross-section of bilateral output and consumption correlations across countries to investigate the relevance of these conjectures.

The data suggest that financial integration results in significantly higher consumption correlations. This result, akin to Lewis (1996), provides support in favor of hypothesis A. The quantity puzzle is a manifestation of restrictions to capital flows, and, holding output correlations constant, the discrepancy diminishes once restrictions to capital flows are accounted for. That said however, output correlations are not invariant to financial flows, and indeed tend to rise with financial integration, as under hypothesis B. In fact, increases in output and consumption correlations are roughly

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[1] Kehoe and Perri (2002) refine the argument, introducing enforcement constraints whereby capital does not flow to the high return country, lest it chooses to default. The intuition is however similar: if capital flows, it is between economies that are out of phase.

of equal magnitudes, and the discrepancy is invariant to capital flows. In the data, therefore, consumption remains less correlated than output even between financially integrated economies: increased risk-sharing synchronizes consumption plans, but affect GDP growth rates similarly, with no end effect on the discrepancy. While the former effect is consistent with theory, the latter is not, and holds therefore the key to the quantity puzzle.

These estimates are true for an aggregate measure of capital flows. When disaggregated into distinct components, the data paint a more contrasted picture. While the bulk of risk-sharing is estimated to work via equities, the positive effect of financial integration on GDP correlations originates in long-term debt flows, and the lifting of restrictions to external accounts. Short-term debt flows correspond to *lower* GDP correlations, consistent with theory, and the evidence in Heathcote and Perri (2002). These distinct effects suggest the information content and purpose of international investment vary with the nature and horizon of different asset classes.

The paper confronts two empirical difficulties. First until recently, the measurement of international financial integration has been hampered by the absence of public data on bilateral capital flows for other economies than the US[2] To alleviate the concern here, as many alternative measures as possible are implemented in the estimations. This includes the standard indices of restrictions to capital accounts published by the IMF or proxies based on net external positions. In addition, the paper relates actual data on bilateral asset holdings for a large sample of country pairs, which have recently been made available for the year 2001, and real variables.[3] A second issue pertains to the endogeneity of financial integration to business cycles. For instance, portfolio theory suggests that, if unfettered, capital should flow between countries at

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[2]Data on capital flows originating from the U.S are readily available, as described for instance in Griever, Lee and Warnock (2001).

[3]For a description of these data, see Lane and Milesi-Ferretti (2003). While these authors are concerned with the determinants of capital flows, the focus here is on their consequences on the real economy.

different stages of their business cycles. This induces a negative endogeneity bias on regressions explaining cycle synchronization with access to finance. The paper uses institutions-based instruments for financial integration inspired from LaPorta et al (1998) to account for this possibility.

The rest of the paper proceeds as follows. Section 2 reviews the relevant literature and introduces the paper's estimation and data. Section 3 presents results on consumption correlations, and shows they remain substantially lower than output correlations even allowing for imperfect access to financial markets. Section 4 discusses the large effect of finance on GDP correlations, and documents its importance in accounting for the quantity puzzle. A sensitivity analysis follows. Section 5 concludes.

2   Methodology

This Section reviews the relevant literature and introduces the estimation methodology. Data sources and a description of the main variables follow.

2.1   Literature

This paper borrows from two distinct literatures: one concerned with risk sharing and its relation with consumption correlations, the other concerned with international business cycles synchronization. They are next reviewed.

It is well known that under complete markets, the social planner will equate the marginal utilities of consumption across countries. Abstracting from non traded goods -or if they are separable in utility- isoelastic preferences then imply that consumption growth rates be perfectly correlated. They are not. Lewis (1999) surveys three explanations. (i) Traded and non traded goods are imperfect substitutes in consumption, and it is only the marginal utilities of consumption in traded goods that should be equated internationally. (ii) There are restrictions to international diversification, and (iii) the gains from risk sharing are too small to motivate actual diversification.

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A considerable literature has evaluated the empirical content of these explanations. Tesar (1993) and Stockman and Tesar (1995) show that introducing non-traded goods can lower the international correlation between consumption growth rates. But Lewis (1997) shows that domestic consumption continues to correlate significantly with domestic output even when non-traded goods are accounted for, an indication that consumption insurance is imperfect. However, Lewis (1996) shows that when corrections for both non-traded goods and institutional restrictions to capital flows are performed, the coefficient becomes non significant. Her results are indicative that income insurance exists in the data when measured appropriately, and if not hampered by regulation.[4] Finally, while Cole and Obstfeld (1991) find only small gains from diversification, Obstfeld (1994) and Athanasoulis and vanWincoop (2000) conclude otherwise in the context of theories where diversification has long-run implications.

Kehoe and Perri (2002) introduce a model in the Real Business Cycles tradition, where limited enforcement is crucial in determining the international correlations of output and consumption. In Backus, Kehoe and Kydland (1994), complete markets result in negatively correlated GDP because capital flows into the economy hit by a positive technology shock, and away from the no-shock economy. Kehoe and Perri show that limited enforcement results in lower capital flows, in that the value of defaulting would increase in the booming economy if it indeed were the recipient of international investment. As a result, the social planner endogenously limits capital flows, and international GDP correlations are higher. By the same token, without limited enforcement, citizens of the country with the positive shock would normally share their gains with the rest of the world. But having to do so once again increases the value of default, so risk sharing is limited and consumption growth rates are less correlated. Models with exogenously restricted access to bond markets have drastically different implications, as negative output correlations and large consumption correlations obtain, if to a lesser

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[4]Lane (2001) presents dissenting evidence, based on assets yields, suggestive that holdings of foreign assets do not generate income insurance. He concludes the jury is still very much out, as his results do not rule out *some* portfolio diversification, or income insurance via capital gains, rather than asset yields.

extent than in the canonical complete markets model. In short, the quantity puzzle is resolved, because there are endogenous limitations to capital flows and risk sharing, resulting in higher GDP correlations, and in lower consumption correlations. If large capital flows are observed, their theory continues to imply negatively correlated GDP fluctuations.

International correlations in GDP fluctuations are also an object of intense scrutiny in their own right. Starting with Frankel and Rose (1998) a considerable empirical literature has concerned itself with their determinants. Frankel and Rose find a large and significant effect of bilateral intensity, a result confirmed in numerous subsequent studies.[5] The list of additional significant variables include a measure of specialization patterns in Imbs (2001, forthcoming), Clark and vanWincoop (2001) or Kalemli-Ozcan, Sorensen and Yosha (2001), the presence of a currency union in Alesina, Barro and Tenreyro (2002) or Rose (2000), or indeed proxies for financial integration in Imbs (forthcoming). These studies will be used in guiding the estimations in this paper.

2.2   Estimation

The paper first asks to what extent the presence (de jure or de facto, depending on what measure is used) of capital flows increases the international correlation in consumption growth rates. In that sense, it is similar in spirit to Lewis's (1996) estimation, which writes

$$\Delta \ln C_{jt} = \theta_t + \beta \, \Delta \ln Y_{jt} + \varepsilon_{jt} \tag{1}$$

where C_{jt} denotes consumption in country j at time t, Y is output and θ_t is a common trend. Perfect income insurance implies $\beta = 0$, which Lewis only fails to reject when non traded goods and financial constraints are controlled for. Estimation (1) comes from the social planner equating marginal utilities across countries, which, with isoelastic preferences separable in non traded goods, implies consumption growth rates are

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[5]See for instance Kose and Yi (2002) or Shin and Wang (2003).

equated, and international consumption correlations perfect. This generalizes to non separable preferences if utility is logarithmic in an aggregate index of traded and non traded goods. Perfect risk sharing then implies

$$\Delta \ln \frac{T_{jt}}{C_{jt}} = \Delta \ln \frac{T_{it}}{C_{it}} \tag{2}$$

with i and j indexing countries, T_t^j (N_t^j) denoting traded (non traded) goods consumption and $C_{jt} = \left(T_{jt}^{1-\phi} + N_{jt}^{1-\phi}\right)^{\frac{1}{1-\phi}}$. In other words, growth rates in the tradeable shares of aggregate consumption should be perfectly correlated internationally.[6]

Estimation (1) is a direct test of risk sharing, but it makes it impossible to compare consumption and output correlations, and to account for the gap between them. Instead, the bilateral approach provides a no less direct test of risk sharing, and has an immediate relation to an analysis of GDP correlations.[7] Thus, this paper tests risk sharing using estimates of α_1 and α_2 in

$$\rho_{ij}^C = \alpha_0 + \alpha_1 \, \Phi_{ij} + \alpha_2 \, \rho_{ij}^Y + \varepsilon_{ij} \tag{3}$$

where ρ_{ij}^C (ρ_{ij}^Y) denotes the correlation in consumption (GDP) growth rates between countries i and j, and Φ_{ij} is a measure of financial integration, defined in one of the manners described in the next section. α_2 is equivalent to Lewis's (1996) test statistics, evaluating whether consumption plans are conditioned by realized output. α_1 captures whether financial integration favors risk sharing, holding constant the correlation in realized GDP. This latter conditioning is crucial. First, consumption plans can appear to be synchronized internationally simply because output fluctuations are too, even though there is no risk sharing at all. Second, it is possible that access to financial integration be independently related with GDP correlations. Then, positive and significant estimates of α_1 in simple bivariate estimations could simply reflect that

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[6]The expression is more complicated under more general preferences, and the present approach based on international correlations would require parameter estimates for the elasticity of substitution between traded and non traded goods, and for the elasticity of intertemporal substitution.

[7]Bilateral correlations in GDP are used as dependent variables in virtually all existing studies in this literature, with the exception of Alesina, Barro and Tenreyro (2002).

finance synchronizes GDP, and thus consumption plans, without any risk sharing at all.

Results in Lewis (1996, 1997) imply the data should point to $\alpha_1, \alpha_2 > 0$. If consumption correlations are computed on the basis of non traded goods only, equation (2) suggests α_2 should become less significant in

$$\rho_{ij}^{TC} = \alpha_0 + \alpha_1 \ \Phi_{ij} + \alpha_2 \ \rho_{ij}^{Y} + \varepsilon_{ij} \tag{4}$$

where ρ_{ij}^{TC} denotes the correlation between $\Delta \ln \frac{T_{jt}}{C_{jt}}$ and $\Delta \ln \frac{T_{it}}{C_{it}}$.

GDP correlations in equations (3) and (4) are endogenous, which is exactly the driving force behind the large empirical literature pioneered in Frankel and Rose (1998). The second half of this paper's empirical approach invokes the results of this literature, to estimate

$$\rho_{ij}^{Y} = \beta_0 + \beta_1 \ \Phi_{ij} + \beta_2 \ X_{ij} + \varepsilon_{ij} \tag{5}$$

where X_{ij} denotes the vector of determinants for bilateral GDP correlations, inspired from existing work. If β_1 happens to be positive and significant, single-equation estimates of α_1 in equation (3) could be biased, since they do not disentangle direct risk sharing effects from indirect ones working via output correlations. In other words, the system formed by equations (3) and (5) must be estimated simultaneously.

Armed with simultaneous estimates for α_1 and β_1, one can directly evaluate to what extent financial restrictions are the key to the quantity puzzle. Theory has it that $\alpha_1 > 0$ and $\beta_1 < 0$, which, if true, suggests the quantity puzzle simply arises from the fact that the world is not integrated financially. If however $\alpha_1 > 0$ but $\beta_1 > 0$, the quantity puzzle stems from the positive association between capital flows and GDP correlations. In both cases, point estimates can help address a quantitative question too: how much financial integration is necessary to actually equate consumption and output correlations in the data.

2.3 Measurement and Data

It has been notoriously difficult to measure effective financial integration between countries. Typical measures include indices capturing balance of payment restrictions, measures of net foreign positions or estimated indices of risk sharing. But restrictions only affect capital flows de jure, not necessarily de facto. And alternatives are at best estimated approximations. One of this paper's contributions is the use of a recently released dataset with direct observations on bilateral asset holdings. The data are gathered by the IMF in the context of a Coordinated Portfolio Investment Survey (CPIS) covering holdings between 67 source and up to 223 destination countries in 2001. Interestingly, capital flows are decomposed into equities, short-term and long-term debt securities. This is useful, for it becomes possible to evaluate whether different components of international investment have distinct effects on real variables.[8] For each type of capital, the actual flow is normalized by total investment in both the recipient and the origin economy, i.e. by computing

$$\Phi_{ij} = \frac{I_{ij} + I_{ji}}{I_i + I_j}$$

where I_{ij} denotes investment flows from country i to country j and $I_i = \sum_j I_{ij}$.

The paper also uses standard measures for financial integration, starting with restrictions indices published in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).[9] They are summed pairwise, and thus report the average number of countries with restrictions to financial flows, for each country pair.[10] Results are reported for each sub-component of the index.

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[8]There are limitations to the CPIS data as well. For instance, since it is based on surveys, underreporting may be an issue, and some economies are simply absent from the collection, though not from the sample used here.

[9]These include four binary variables: (i) an indicator of multiple exchange rates, (ii) an indicator of current account restrictions, (iii) an indicator of capital account restrictions and (iv) an indicator of whether export proceeds surrender is required.

[10]The composite index from AREAER is averaged each year, and thus can take values 0.25, 0.5,

One additional proxy for effective capital flows is proposed. Capital should flow between countries with different (or even opposite) external positions. Two creditor (debtor) countries will both tend to be issuers (recipients) of capital flows, and bilateral flows should be less than between a creditor and a debtor economies. Therefore, a proxy for capital flows can be computed using the recent dataset on net foreign positions from Lane and Milesi-Ferretti (2001) to construct

$$\Phi_{ij} = \left| \left(\frac{NFA}{GDP} \right)_i - \left(\frac{NFA}{GDP} \right)_j \right|$$

where NFA denotes the net foreign asset position in country i. Φ_{ij} will take high values between countries with diverging external positions. As in Lane and Milesi-Ferretti, NFA can be computed in a variety of ways, using cumulated current accounts, or the sum of net positions in Foreign Direct Investment, Equities and Debt.[11]

No matter how it is measured, financial integration is endogenous in the system formed by equations (3) and (5), since agents may choose to diversify and invest in economies whose cyclical properties are different from their own. It must be instrumented. La Porta et al (1998) show how a set of institutional variables pertaining to legal arrangements constitute a good predictor of the financial advancement of an economy. This paper extends this result to bilateral financial depth, and indeed, the development of domestic financial markets is likely to result in international financial linkages. This will happen simply as international investors find it easier to access to domestic assets, but also perhaps as the degree of sophistication associated with domestic financial transactions extend to international operations. Institutional variables also find support in the high persistence observed in financial flows.[12]

0.75 or 1. It is then summed pairwise, and averaged over the whole period. Using initial values makes no difference.

[11]In what follows, a measure based on cumulated current accounts is chosen, but results are not dissimilar when using alternatives. Φ is averaged over the whole sample, but virtually identical results obtain with initial values.

[12]See Portes and Rey (2003) or Lane and Milesi-Ferretti (2003).

The variables in La Porta et al (1998) fall into four distinct categories: (i) legal families, (ii) shareholders rights, (iii) creditors rights and (iv) enforcement. Following the same categories, the instrument set used here includes: (i) binary variables for the French, German and British legal systems, (ii) indices capturing whether shares can be blocked prior to a general meeting, whether votes are cast cumulatively or proportionately, whether minority shareholders are oppressed, whether shareholders have pre-emptive rights, the percentage of votes necessary to call an extraordinary meeting, an index of "anti-director rights", the extent of mandatory dividends, (iii) an index of creditors rights, (iv) the efficiency of the judicial system and an assessment of the rule of law.[13]

The variables included in X_{ij} are relatively standard, and include the measure of bilateral trade intensity defined in Frankel and Rose (1998) as

$$TR_{ij} = \frac{1}{T} \sum_t \frac{EX_{i,j,t} + IM_{i,j,t}}{NY_{i,t} + NY_{j,t}}$$

where $EX_{i,j,t}$ denotes total merchandise exports from country i to j in year t, $IM_{i,j,t}$ are imports to i from j, and NY_i denotes nominal GDP in country i. Bilateral trade data are from the IMF's Direction of Trade Statistics. Following Clark and vanWincoop (2001) and Imbs (forthcoming), sectorial real value added data are used to compute

$$S_{i,j} = \frac{1}{T} \sum_t \sum_n^N |s_{n,i} - s_{n,j}|$$

where $s_{n,i}$ denotes the GDP share of industry n in country i. $S_{i,j}$ is the time average of the discrepancies in economic structures of countries i and j, and reaches its maximal value for two countries with no sector in common.[14] The sectorial shares s are computed using two-digit manufacturing value added data issued from UNIDO.[15]

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[13]These instruments were chosen to maximize the first-stage fit, using a general to specific selection method, but results are not sensitive to alternative sets.

[14]Both the trade and specialization measures are based on time averages. Results do not change if the initial value is used instead.

[15]The UNIDO data covers manufactures only, and thus a shrinking share of most economies. An alternative exists in the United Nations Statistical Yearbook (UNYB), which provides sectoral value added at the one-digit level for all sectors, but with limited country coverage.

As with finance, trade intensity (and specialization patterns) can be endogenous. For instance, specialization can actually depend on financial depth; and bilateral trade intensity may be conditioned by cycles synchronization.[16] While these potential biases are less directly relevant to the estimates of interest here, proper care must be given to ensuring they are not affecting the results. The paper follows an enormous literature using gravity variables to instrument for trade intensity. Specialization, in turn, is instrumented using measures of economic development, following Imbs (forthcoming).[17] All these controls are deferred into a sensitivity analysis, but importantly, the main conclusions of the paper are unchanged irrespective whether trade and specialization are instrumented or not.

Finally, implementing estimation (4) requires data on disaggregated consumption across countries. Lewis (1996) uses the United Nations International Comparison Program, which decomposes aggregate consumption into about one hundred goods in 1970, 1975, 1980 and 1985. Here, computing ρ_{ij}^{TC} necessitates more time variation, which exists in an alternative, if coarser, dataset. The United Nations Statistical Yearbook provides a decomposition of consumption into roughly two-digit sectors across countries, and more importantly annually over the 1970-1996 period.[18] This is much less detailed than the data in Lewis (1996), but serves the purpose of verifying whether the results in Lewis (1996) continues to hold using the bilateral approach preferred in this

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[16]See Imbs (forthcoming) for details.

[17]The gravity variables for trade include (log) kilometric distance, binary variables capturing the presence of a common border and a common language, (log) products of geographic areas and (log) products of populations. Instruments for specialization include the (log) product of GDP per capita, and the (log) GDP disparity.

[18]The sectors covered -along with their allocation to a traded (T) or non-traded (N) sector- are: Food (T), Non-alcoholic beverages (T), Alcoholic beverages (T), Tobacco (T), Clothing and Footwear (T), Gross rent (N), Fuel and Power (T), Furniture, furnishing and household equipment (T), Household operation (N), Medical care and health expenses (N), Transport and communication (N), Personal transport equipment (N), Recreational, entertainment, education and cultural services (N), Education (N), Personal care (N), Expenditures in restaurants, cafes and hotels (N), and Research and science (N).

paper.

Combining all these data sources and constraints generates a sample covering a cross-section of 41 countries, or 820 bilateral observations. The countries are listed in an Appendix.

3   Risk Sharing and Consumption

This section establishes the significant role of financial integration in affecting consumption correlations. The results in Lewis (1996) are reproduced within a bilateral approach. This makes it possible to quantify how much of a change in financial links would be necessary to equate international correlations in consumption and in output, on average, i.e. to start addressing the quantity puzzle, on the basis that *only* consumption correlation depends on financial integration.

Table 1 reports OLS estimates for equation (3). Consistent with the view that aggregate consumption is conditioned by available domestic output, GDP correlations are strongly significant and positive. More interestingly, there is very little evidence that financially integrated economies have more synchronized consumption, with α_1 significant and positive in only one out of ten cases. At best, finance could affect GDP fluctuations, and then consumption via that channel.

But the need to integrate financial markets may well be endogenous, for instance determined by some (exogenously given) tendency for consumption plans to be idiosyncratic across countries. That would happen in economies with given fully diversified production, and less of a need to integrate as a consequence. This is an attenuating endogeneity bias, since it suggests finance is redundant when consumption plans are correlated. Table 2 gives a strong indication this is at play in the data, presenting results where financial integration is instrumented using the institutional variables in La Porta et al (1998). Now, α_1 becomes positive and significant in six out of ten

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cases. That said, however, consumption plans appear to still strongly depend on the realization of GDP fluctuations, both statistically and economically.

The point estimates in Table 2 suggest the economic effects of financial integration on consumption correlations are rather minimal. For instance, a one-standard deviation fall in the overall AREAER index results in a consumption correlation coefficient higher by little more than one percentage point. This falls drastically short of equating consumption and output correlation in this sample, where the average of ρ_{ij}^C equals 0.061, against 0.159 for ρ_{ij}^Y. The impact of current account liberalization is in the same ballpark. The only estimate implying a large economic effect is that of capital account liberalization, where a one-standard error increase results in a correlation higher by 2.6%. Still, equating consumption and output correlations on average in this sample would require a four-standard deviation decrease in capital account restrictions, or moving from arrangements akin to those between for instance Botswana and El Salvador to those that prevail between Hong Kong and Switzerland... And this would merely equate consumption and output correlations.

Table 3 focuses on tradeable goods consumption to compute the dependent variable in equation (4). The theoretical conditions for perfect correlation between consumption growth rates in traded goods are not general, and yet, the results in Table 4 are stronger, and not inconsistent with Lewis (1996). First, α_2 loses some statistical significance, and point estimates are two to three times smaller. This suggests the realization of domestic output is less important in affecting traded good consumption, as implied by theory. Second, estimates for α_1 increase in magnitude and in significance, again, as implied by theory. Third, interestingly, the data suggests it is mostly restrictions to the current account, and to a lesser extent to the capital account, that constrain income insurance. Multiple exchange rate arrangements, or mandatory surrender of export proceeds matter less. Finally, the CPIS data suggests that it is via equities that most of risk sharing occurs, rather than via short or long term debt securities. Estimates for α_1 based on total capital flows and on equity holdings only are virtually identical and both significant, whereas others are zero.

The economic magnitude of the effects estimated in Table 3 is also larger. For example, in response to a one-standard deviation fall in current account restrictions, ρ^C is estimated to increase by 4.3 percentage points, and by 3.5 points when it is the capital account that is liberalized. But the road is longer in this data, where the discrepancy between output and consumption correlations is larger on average ($\bar{\rho}^C = 0.036$ and $\bar{\rho}^Y = 0.235$), so that the type of change in Φ needed to equate the two remains implausibly large. Integration on the equity markets is more promising from this standpoint, as the estimate in the lower panel of Table 3 imply ρ^C increases by 7.3 percentage points when equity holdings rise by one standard deviation. Now, equating consumption and output correlations "only" requires an increase in bilateral equity holdings equal to three standard deviations.

However, none of these estimates account for the possibility that output correlations themselves respond positively to financial integration, thus driving endogenously the discrepancy upwards. The next section assesses the validity and relevance of this conjecture.

4   Finance and Output Correlations

This section presents estimates of the system formed by equations (3) and (5). Some benchmark results are first discussed, followed with a sensitivity analysis.

4.1   Main Results

Table 4 presents simultaneous estimates for the system formed by equations (3) and (5). As the previous section suggests, equation (3) does not constitute an exact test for risk sharing, as it involves aggregate consumption correlations inclusive of non traded goods. The corresponding estimates for α_1 therefore constitute lower bounds for the effects of finance on consumption. But the quantity puzzle has to do with the

discrepancy between aggregates of output and consumption growth rates. In theory, integration in financial markets affects the consumption of traded goods only, but the production of all goods, as capital flows make resources available to both the traded and non-traded sectors.[19]

Estimates for α_1 in Table 4 are very similar to Table 2. This suggests single equation estimates of risk sharing are roughly accurate, and unaffected by the endogeneity of GDP correlation to finance. The interesting results pertain to estimates of β_1 in equation (5). In almost all cases, the effect is positive and significant: financial integration does affect output correlations, and it does so positively. This constitutes a challenge from the standpoint of existing theories, including those with incomplete markets, restricted access to some classes of assets or limited enforcement. There are two exceptions. The first one concerns the estimated effect of short run debt securities, whose prevalence appears to be associated with *lower* GDP correlations, consistent with theory. This is an important difference, for it suggests short-term debt flows might be more consistent with Real Business Cycle models, a compared with long-term debt. As the next section demonstrates, this discrepancy in the results is also robust to alternative instrumentation strategies and data samples. That said however, it is also true that the CPIS data contains substantially fewer observations on short-term debt relative to all other asset classes. It is therefore hard to establish whether these contrasted results are a robust feature of the data, an interesting property specific to short term debt flows, or merely an artefact of low power. The verdict will have to wait until further data is collected and released.

The second exception pertains to multiple exchange rate arrangements, estimated to result in less correlated cycles. This might however be a manifestation of a more general effect of exchange rate arrangements on business cycles, as in Artis and Zhang (1999). It also turns out to be sensitive to the instrument set.

Based on the estimates in Table 4, the effect of finance on GDP correlations is

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[19]Furthermore, focusing on traded consumption and output considerably reduces the data coverage.

larger in magnitude and in significance than its effect on consumption. In particular, restrictions on the capital account appear to have the largest impact, along with regulation of export proceeds. As for effective capital flows, long term debt contributes the bulk of the measured effect. That these effects should be larger than these of risk sharing on consumption explains in a sense the quantity puzzle: financial integration increases consumption correlations, but it increases GDP synchronization even more. Thus the discrepancy remains large, but not because of imperfect risk sharing.

Quantitatively, a one standard deviation decrease in capital account restrictions corresponds to about 5.1 percentage point increase in GDP correlations. Thus, a one standard deviation fall in capital account restrictions increases ρ^C by 2.6% and ρ^Y by 5.1%. But the latter effect is absent from most explanations for the quantity puzzle, which if anything predict $\beta_1 < 0$. Holding ρ^Y constant, a policy change of this magnitude actually brings consumption correlations closer to output correlations by almost eight percentage points. Given the average correlations in this sample, a little more than a one-standard deviation fall in capital account restrictions would be sufficient to equate output and consumption correlations on average. The interpretation of the coefficients on total capital flows measured in the CPIS data, or on long term debt securities, are very similar in magnitude. For instance, increasing the bilateral flows of long term debt securities by one standard deviation (e.g. going from Sweden-Switzerland to Japan-United States) is estimated to correspond to GDP correlations increased by 6.2%. The true challenges posed by the quantity puzzle are understanding (i) why β_1 is significantly positive when estimated using long-term debt flows, but significantly negative when using short-term flows, and (ii) why GDP correlations do respond to financial integration in a way that is inconsistent with existing theories.

4.2   Sensitivity Analysis

This section ensures the robustness of the main results. First, the choice of instruments is modified to incorporate the possibility that bilateral flows of goods and assets have

similar determinants, or are directly related to each other. Second, the estimation is performed on a subset of OECD economies.

4.2.1 Instruments

There are several important reasons why the determinants of bilateral exchanges on the goods and on the asset markets could be directly related. Obstfeld and Rogoff (2001) show that frictions on the goods market are sufficient to create a home bias on the asset market. Empirically, this means that financial integration should be allowed to include determinants customarily associated with goods trade. Portes and Rey (2003) and Portes, Rey and Oh (2001) provide supporting evidence of this possibility, showing that capital flows are significantly conditioned by the availability of relevant information. In particular, the same geographic variables associated with trade in goods tend to predict trade in assets as well.[20] Thus, in what follows, a standard set of "gravity" variables are added to the instrument set for Φ_{ij}, *and* are used to account for the endogeneity of bilateral trade as well.

Trade in goods is, possibly, accompanied by trade in assets by virtue of simple balance of payments accounting (although not necessarily bilaterally). Furthermore, the familiarity acquired through goods trade partly applies to trade in assets. Financial integration then builds on the informational advantage acquired on the goods markets.[21] Both variables should be allowed to depend on each other. Finally, both variables are likely to result in specialization of production, and to be closely intertwined as a consequence: financially integrated regions can afford to be specialized in production, but must then be open to goods as well, so that what is not produced is available to domestic consumers. This suggests some endogeneity of specialization patterns, and

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[20]Furthermore, Martin and Rey (forthcoming) provide a theoretical argument why, in the presence of frictions on assets markets, economic size should also affect positively capital flows.

[21]Portes and Rey (2003) and Portes, Rey and Oh (2001) provide extensive discussions of these possibilities, and confront them successfuly with their data on bilateral financial flows.

some account of their dependence on trade in both goods and assets.[22]

Table 5 presents estimates with (i) gravity variables instrumenting trade intensity, and included in the set of instruments for Finance, (ii) instruments for specialization patterns, (iii) allowances for interactions between Trade, Finance and Specialization, which are all allowed to depend on each other. No results are altered. GDP fluctuations in countries with liberalized external accounts, and more specifically capital accounts, are significantly more synchronized, and long-term debt contracts also result in high GDP correlations. The contrast between short and long term securities persists, with large and significantly negative estimates of β_1 in the third column of Table 5 (lower panel).

Controls for GDP per capita in equations (3) and (5) do not change results either (Tables not reported - to be completed)

4.2.2 OECD Countries

Table 6 presents results when the system is estimated on the basis of data from 22 OECD countries only. This is potentially informative, for it helps assessing whether differences in the composition of capital flows specific to developing economies matter for the result. The short answer is it does not. All the results persist, with larger point estimates most of the time. Interestingly, ρ_{ij}^Y becomes less significant in equation (3) - and indeed not different from zero in two cases. This suggests realized GDP correlations matter less, if at all, for consumption correlations in OECD countries. This could reflect these economies are less "liquidity constrained" to use the terminology in Lewis (1997).

Unrestricted capital accounts continue to correspond to high consumption and GDP correlations, and risk sharing continues to work mostly through equity holdings. Most interestingly, the distinct effects of long-run and short-run debt securities continue to prevail. Lots of long-run debt flows are associated with high GDP correlations, but the opposite obtains for short-run debt contracts. This is important, for it suggests the

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[22]These distinct channels are discussed in Imbs (forthcoming).

result is not driven by the specific composition of long-term debt in rich countries vs. developing ones.

4.3 Conclusion

This paper has presented systematic evidence on the effects of financial integration on both output and consumption international correlations, with a view to shedding light on the quantity puzzle. Consistent with theory, financial linkages increase consumption correlations, particularly for traded goods. Less consistent with theory, however, a variety of measures suggest more integrated economies also have more synchronized GDP fluctuations. The quantity puzzle does not arise from lack of risk sharing, and low consumption correlations as a result, but rather from the oft ignored fact that financial integration does affect GDP correlations too. When this possibility is accounted for, the point estimates in this paper suggest a one-standard deviation increase in financial integration could be enough to actually equate output and consumption correlations.

This paper also makes use of novel data, measuring directly effective assets holdings between countries, as well as their main components. While aggregate holdings confirm the evidence described above, disaggregated data point to contrasted effects. Capital flows intensive in long-run debt are associated with high GDP correlations, but in contrast, short-run debt appears to correspond to less correlated business cycles. In other words, short-run debt flows are consistent with a Real Business Cycles view of capital flows, while long-run ones are not.

Appendix: Country Coverage

Argentina	Hong Kong	Peru
Australia	India	Singapore
Austria	Indonesia	South Africa
Belgium	Ireland	Spain
Brazil	Israel	Sri Lanka
Canada	Italy	Sweden
Chile	Japan	Switzerland
Colombia	Korea	Thailand
Denmark	Malaysia	Turkey
Ecuador	Mexico	The United Kingdom
Egypt	The Netherlands	United States
Finland	New Zealand	Uruguay
France	Norway	Zimbabwe
Greece	Pakistan	

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Table 1: Consumption Correlations					
	AREAER (Tot.)	AREAER(ER)	AREAER (CA)	AREAER (CAPA)	AREAER (Surr.)
Finance	-1.25×10^{-3} -0.37	0.0140 1.20	-8.63×10^{-3} -0.85	-0.0125 -1.21	-1.63×10^{-3} -0.15
Output	0.3821 15.55***	0.3854 16.21***	0.3792 15.45***	0.3782 15.56***	0.3833 15.41***
Obs.	820	820	820	820	820
	NFA (CA)	CPIS (Tot.)	CPIS (Equity)	CPIS (Short)	CPIS (Long)
Finance	0.0168 2.32**	-5.79×10^{-4} -0.30	-1.48×10^{-3} -0.78	-4.43×10^{-3} -1.39	-1.71×10^{-4} -0.07
Output	0.3754 15.40***	0.3797 13.06***	0.3796 12.79***	0.3754 9.09***	0.3843 12.29***
Obs.	780	607	552	286	523

Notes: The dependent variable is the pairwise correlation of consumption growth rates. All equations control for the bilateral correlation in GDP growth rates, denoted "Output". "Restrictions" correspond to a time-average of the four measures of restrictions to capital flows in AREAER: (i) multiple exchange rates, (ii) restrictions to the current account, (iii) restrictions to the capital account, and (iv) mandatory surrenders of export proceeds. NFA is a measure of Net Foreign Assets as implied by cumulated current account, taken from Lane and Milesi-Ferretti (2001). CPIS denotes data from the IMF's Coordinated Portfolio Investment Survey, collected in 2001, and its three sub-divisions into equity holdings, and short and long-term debt securities. NFA and CPIS enter in logarithms.

	AREAER (Tot.)	AREAER(ER)	AREAER (CA)	AREAER (CAPA)	AREAER (Surr.)
Table 2: Consumption Correlations - Instrumental Variables Estimations					
Finance	-0.0103 -2.51**	-4.48×10^{-3} -0.31	-0.0251 -2.15**	-0.0506 -3.29***	-0.0361 -2.61***
Output	0.3652 14.56***	0.3841 16.12***	0.3694 14.89***	0.3593 14.29***	0.3594 13.94***
Obs.	820	820	820	820	820
	NFA (CA)	CPIS (Tot.)	CPIS (Equity)	CPIS (Short)	CPIS (Long)
Finance	0.0255 2.10**	6.87×10^{-3} 1.69*	6.04×10^{-3} 1.56	4.55×10^{-3} 0.68	6.46×10^{-3} 1.22
Output	0.3714 14.98***	0.3436 10.06***	0.3486 10.52***	0.3541 8.03***	0.3554 9.43***
Obs.	780	607	552	286	523

Notes: The dependent variable is the pairwise correlation of consumption growth rates. All equations control for the bilateral correlation in GDP growth rates, denoted "Output". "Restrictions" correspond to a time-average of the four measures of restrictions to capital flows in AREAER: (i) multiple exchange rates, (ii) restrictions to the current account, (iii) restrictions to the capital account, and (iv) mandatory surrenders of export proceeds. NFA is a measure of Net Foreign Assets as implied by cumulated current account, taken from Lane and Milesi-Ferretti (2001). CPIS denotes data from the IMF's Coordinated Portfolio Investment Survey, collected in 2001, and its three sub-divisions into equity holdings, and short and long-term debt securities. NFA and CPIS enter in logarithms. The instruments are taken from La Porta et al (1998), and include: (i) binary variables for the French, German and British legal systems, (ii) indices capturing whether shares can be blocked prior to a general meetings, whether votes are cast cumulatively or proportionately, whether minority shareholders are oppressed, whether shareholders have pre-emptive rights, the percentage of votes necessary to call an extraordinary meeting, an index of "anti-director rights", the extent of mandatory dividends, (iii) an index of creditors rights, (iv) the efficiency of the judicial system and an assessment of the rule of law. Elasticities are computed using the reported point estimates (when significant at the 10% level at least), and average values of the relevant variables in each sample. The reported percentages represent the increase in financial integration required to equate consumption and output correlations on average in each sample.

	AREAER (Tot.)	AREAER(ER)	AREAER (CA)	AREAER (CAPA)	AREAER (Surr.)
Table 3: Traded Goods Consumption - Instrumental Variables Estimations					
Finance	-0.0257 -2.92***	-0.0349 -1.05	-0.0943 -3.56***	-0.0651 -2.50**	-0.0440 -1.73*
Output	0.1409 2.91***	0.1900 4.13***	0.1402 2.96***	0.1472 3.03***	0.1571 3.17***
Obs.	351	351	351	351	351
	NFA (CA)	CPIS (Tot.)	CPIS (Equity)	CPIS (Short)	CPIS (Long)
Finance	0.0458 1.71*	0.0247 3.38***	0.0249 3.71***	0.0111 0.91	0.0116 1.30
Output	0.1767 3.74***	0.1547 2.66***	0.1841 3.35***	0.2149 3.23***	0.1762 2.80***
Obs.	351	306	288	185	282

Notes: The dependent variable is the pairwise correlation of traded goods to total consumption growth rates, as implied by disaggregated data from the United Nations Yearly Statistical Yearbook. All equations control for the bilateral correlation in GDP growth rates, denoted "Output". "Restrictions" correspond to a time-average of the four measures of restrictions to capital flows in AREAER: (i) multiple exchange rates, (ii) restrictions to the current account, (iii) restrictions to the capital account, and (iv) mandatory surrenders of export proceeds. NFA is a measure of Net Foreign Assets as implied by cumulated current account, taken from Lane and Milesi-Ferretti (2001). CPIS denotes data from the IMF's Coordinated Portfolio Investment Survey, collected in 2001, and its three sub-divisions into equity holdings, and short and long-term debt securities. NFA and CPIS enter in logarithms. The instruments are taken from La Porta et al (1998), and include: (i) binary variables for the French, German and British legal systems, (ii) indices capturing whether shares can be blocked prior to a general meetings, whether votes are cast cumulatively or proportionately, whether minority shareholders are oppressed, whether shareholders have pre-emptive rights, the percentage of votes necessary to call an extraordinary meeting, an index of "anti-director rights", the extent of mandatory dividends, (iii) an index of creditors rights, (iv) the efficiency of the judicial system and an assessment of the rule of law. Elasticities are computed using the reported point estimates (when significant at the 10% level at least), and average values of the relevant variables in each sample. The reported percentages represent the increase in

financial integration required to equate consumption and output correlations on average in each sample.

Table 4: Simultaneous Estimation - Instrumented Finance					
	AREAER (Tot.)	AREAER(ER)	AREAER (CA)	AREAER (CAPA)	AREAER (Surr.)
ρ^C					
Finance	-0.0102 -2.43**	-2.08x10^{-3} -0.14	-0.0224 -1.83*	-0.0481 -3.18***	-0.0358 -2.54**
Output	0.3700 9.05***	0.4296 11.39***	0.3921 9.54***	0.3638 9.12***	0.3597 8.57***
ρ^Y					
Finance	-0.0166 2.62***	0.0567 2.81***	-0.0375 -2.11**	-0.0971 -4.86***	-0.0758 -3.82***
Trade	0.0343 7.21***	0.0479 11.90***	0.0367 7.99***	0.0339 8.46***	0.0317 6.94***
Structure	-0.2361 -11.77**	-0.2139 -10.91***	-0.2275 -11.55***	-0.2387 -11.96***	-0.2371 -12.09***
Obs.	820	820	820	820	820

	NFA (CA)	CPIS (Tot.)	CPIS (Equity)	CPIS (Short)	CPIS (Long)
ρ^C					
Finance	0.0172 1.41	7.25x10^{-3} 1.75*	3.89x10^{-3} 1.05	1.94x10^{-3} 0.33	7.62x10^{-3} 1.44
Output	0.4151 10.61***	0.3205 5.00***	0.3916 6.88***	0.3705 5.90***	0.3162 4.81***
ρ^Y					
Finance	0.0481 2.89***	0.0150 1.95**	-8.32x10^{-3} -1.15	-0.0208 -2.35**	0.0205 2.37**
Trade	0.0348 8.15***	0.0443 4.01***	0.0621 5.66***	0.0714 6.23***	0.0433 4.16***
Structure	-0.2441 -11.68***	-0.2153 -8.22***	-0.2444 -8.81***	-0.2084 -5.93***	-0.1949 -6.84***
Obs.	780	607	552	286	523

Notes: The "Consumption" heading corresponds to estimation (3), with the pairwise corre-lation in consumption growth as a dependent variables. The "Output" heading corresponds to equation (5) focused on GDP correlations. "Restrictions" correspond to a time-average of the four measures of restrictions to capital flows in AREAER: (i) multiple exchange rates, (ii) restrictions to the current account, (iii) restrictions to the capital account, and (iv) manda-tory surrenders of export proceeds. NFA is a measure of Net Foreign Assets as implied by

cumulated current account, taken from Lane and Milesi-Ferretti (2001). CPIS denotes data from the IMF's Coordinated Portfolio Investment Survey, collected in 2001, and its three sub-divisions into equity holdings, and short and long-term debt securities. NFA and CPIS enter in logarithms. Instruments for "Finance" are taken from La Porta et al (1998), and include: (i) binary variables for the French, German and British legal systems, (ii) indices capturing whether shares can be blocked prior to a general meetings, whether votes are cast cumulatively or proportionately, whether minority shareholders are oppressed, whether shareholders have pre-emptive rights, the percentage of votes necessary to call an extraordinary meeting, an index of "anti-director rights", the extent of mandatory dividends, (iii) an index of creditors rights, (iv) the efficiency of the judicial system and an assessment of the rule of law. The Trade and Structure variables are described in the text, and use data from the IMF's Direction of Trade and manufacturing data from UNIDO, respectively. They both enter in logarithms.

Table 5: Simultaneous Estimation - Alternative Instruments					
	AREAER (Tot.)	AREAER(ER)	AREAER (CA)	AREAER (CAPA)	AREAER (Surr.)
ρ^C					
Finance	-0.0115 -2.53**	-1.73x10^{-4} -0.01	-0.0273 -2.15**	-0.0624 -3.90***	-0.0347 -2.23**
Output	0.3624 8.29***	0.4485 11.53***	0.3901 9.18***	0.3275 7.61***	0.3526 7.55***
ρ^Y					
Finance	-0.0159 2.20**	0.0862 4.01***	-0.0426 -2.16**	-0.0928 -4.55***	-0.0700 -3.19***
Trade	0.0391 5.10***	0.0693 11.22***	0.0404 5.60***	0.0369 6.13***	0.0357 5.03***
Structure	-0.3044 -8.64**	-0.2153 -6.32***	-0.3060 -8.69***	-0.3281 -9.87***	-0.2958 -9.01***
Obs.	778	778	778	778	778

	NFA (CA)	CPIS (Tot.)	CPIS (Equity)	CPIS (Short)	CPIS (Long)
ρ^C					
Finance	0.0273 2.30**	5.43x10^{-3} 1.46	6.93x10^{-4} 0.21	3.85x10^{-3} 0.74	4.73x10^{-3} 1.13
Output	0.3753 8.92***	0.3024 4.88***	0.4012 7.19***	0.3605 5.77***	0.3188 5.21***
ρ^Y					
Finance	0.0463 2.76***	0.0193 3.49***	-7.22x10^{-3} -1.33	-0.0229 -3.08***	0.0183 3.07***
Trade	0.0313 4.27***	0.0274 2.73***	0.0701 6.62***	0.0988 7.34***	0.0356 3.54***
Structure	-0.3508 -8.68***	-0.2213 -5.92***	-0.2997 -7.84***	-0.3419 -7.85***	-0.2089 -5.25***
Obs.	740	602	548	284	520

Notes: The "Consumption" heading corresponds to estimation (3), with the pairwise correlation in consumption growth as a dependent variables. The "Output" heading corresponds to equation (5) focused on GDP correlations. "Restrictions" correspond to a time-average of the four measures of restrictions to capital flows in AREAER: (i) multiple exchange rates, (ii) restrictions to the current account, (iii) restrictions to the capital account, and (iv) mandatory surrenders of export proceeds. NFA is a measure of Net Foreign Assets as implied by

cumulated current account, taken from Lane and Milesi-Ferretti (2001). CPIS denotes data from the IMF's Coordinated Portfolio Investment Survey, collected in 2001, and its three subdivisions into equity holdings, and short and long-term debt securities. NFA and CPIS enter in logarithms. Instruments for "Finance" are taken from La Porta et al (1998), and include: (i) binary variables for the French, German and British legal systems, (ii) indices capturing whether shares can be blocked prior to a general meetings, whether votes are cast cumulatively or proportionately, whether minority shareholders are oppressed, whether shareholders have pre-emptive rights, the percentage of votes necessary to call an extraordinary meeting, an index of "anti-director rights", the extent of mandatory dividends, (iii) an index of creditors rights, (iv) the efficiency of the judicial system and an assessment of the rule of law. The Trade and Structure variables are described in the text, and use data from the IMF's Direction of Trade and manufacturing data from UNIDO, respectively. They both enter in logarithms. Trade is now instrumented using (log) distance, binary variables capturing the presence of a common border and a common language, the (log) product of the countries' geographic areas, and the (log) product of their populations. These variables are also added to the instrument set for Φ. Structure is instrumented on the (log) product of per capita GDP and the (log) GDP disparity. In addition, Finance is allowed to depend on Trade and vice-versa. Finally, specialization is allowed to respond to both Trade and Finance.

	AREAER (Tot.)	AREAER(ER)	AREAER (CA)	AREAER (CAPA)	AREAER (Surr.)
Table 6: Simultaneous Estimation - OECD Countries					
ρ^C					
Finance	-0.0270 -2.74***	0.0336 0.72	-0.0476 -1.35	-0.0985 -4.11***	-0.0500 -2.09**
Output	0.2262 3.42***	0.3266 5.44***	0.2787 4.24***	0.1930 3.03***	0.2621 4.05***
ρ^Y					
Finance	-0.0342 2.81***	-0.1429 -2.20**	-0.0533 -1.10	-0.0877 -2.90***	-0.0673 -2.26**
Trade	0.0642 5.35***	0.0828 6.56***	0.0755 5.90***	0.0640 5.26***	0.0637 5.31***
Structure	-0.1393 -2.75***	-0.1365 -2.60***	-0.1280 -2.45**	-0.1526 -3.08***	-0.1635 -3.26***
Obs.	210	210	210	210	210

	NFA (CA)	CPIS (Tot.)	CPIS (Equity)	CPIS (Short)	CPIS (Long)
ρ^C					
Finance	0.0151 0.58	0.0277 3.72***	0.0155 2.48**	0.0125 1.57	0.0299 3.57***
Output	0.3426 5.73***	0.1085 1.46	0.2153 3.14***	0.1913 2.68***	0.0843 1.11
ρ^Y					
Finance	9.19×10^{-4} 0.02	0.0211 1.83*	-1.98×10^{-3} -0.19	-0.0477 -3.05***	0.0295 2.40**
Trade	0.0727 5.94***	0.0618 4.14***	0.0721 4.93***	0.0924 5.05***	0.0579 3.79***
Structure	-0.1652 -2.88***	-0.1266 -2.21**	-0.1591 -2.61***	-0.2715 -3.56***	-0.1249 -2.27**
Obs.	210	205	203	150	201

Notes: The "Consumption" heading corresponds to estimation (3), with the pairwise correlation in consumption growth as a dependent variables. The "Output" heading corresponds to equation (5) focused on GDP correlations. "Restrictions" correspond to a time-average of the four measures of restrictions to capital flows in AREAER: (i) multiple exchange rates, (ii) restrictions to the current account, (iii) restrictions to the capital account, and (iv) mandatory surrenders of export proceeds. NFA is a measure of Net Foreign Assets as implied by

cumulated current account, taken from Lane and Milesi-Ferretti (2001). CPIS denotes data from the IMF's Coordinated Portfolio Investment Survey, collected in 2001, and its three sub-divisions into equity holdings, and short and long-term debt securities. NFA and CPIS enter in logarithms. Instruments for "Finance" are taken from La Porta et al (1998), and include: (i) binary variables for the French, German and British legal systems, (ii) indices capturing whether shares can be blocked prior to a general meetings, whether votes are cast cumulatively or proportionately, whether minority shareholders are oppressed, whether share-holders have pre-emptive rights, the percentage of votes necessary to call an extraordinary meeting, an index of "anti-director rights", the extent of mandatory dividends, (iii) an index of creditors rights, (iv) the efficiency of the judicial system and an assessment of the rule of law. The Trade and Structure variables are described in the text, and use data from the IMF's Direction of Trade and manufacturing data from UNIDO, respectively. They both enter in logarithms.