



**European Bank**  
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# The interest group theory of financial development: evidence from regulation

**Cagatay Bircan, David Hauner and Alessandro Prati**

## **Abstract**

We use a new dataset of *de jure* measures of trade, capital account, product market and domestic financial regulation for 91 countries from 1973 to 2005 to test Rajan and Zingales's (2003) interest group theory of financial development. In line with the theory, we find strong evidence that trade liberalisation is a leading indicator of domestic financial liberalisation. This result is robust to the use of different data frequencies, estimation methods and a check for non-linear effects. However, in contrast to the theory, we do not find consistent evidence of an effect of capital account liberalisation on financial development.

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Keywords: Financial development, financial liberalisation, trade liberalisation

JEL Classification Number: F13, G00, O16

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# 1. Introduction

The role of economic openness in financial development has received particular attention since the contribution by Rajan and Zingales (2003). Their “interest group theory” stresses the role of trade and financial openness in reducing the influence of interest groups that oppose financial development. In a closed economy, incumbents benefit from financial repression and the resulting low financial development because it denies potential competitors the financial resources to enter the market. Increasing both trade and capital account openness undermines this status quo. Foreign entry in the domestic goods markets reduces rents and creates more investment needs for incumbents to counter competition and take advantage of new opportunities.<sup>1</sup> At the same time, opening up capital flows renders financial repression increasingly impossible to implement. Studies have tested the effect of trade and financial openness on the liberalisation and development of the financial sector from various angles.

So far, tests of the interest group theory have relied on *de facto* measures of openness or financial development, for example trade/GDP or credit/GDP. However, lack of a consistent dataset of regulations across sectors has prevented the possibly most compelling test, namely to examine the effect of liberalisation in other sectors on domestic financial liberalisation.<sup>2</sup> Such a test may be more appropriate than those based on *de facto* measures for several reasons. First, *de facto* openness may rise without any trade liberalisation or reduction in rents: for example, higher commodity prices would tend to increase *de facto* openness in both importing and exporting countries with no change in trade policies and, possibly, even with an *increase* of rents in commodity exporting countries. Similarly, higher *de facto* financial depth indicators may not be an indication of domestic financial reform or of a smaller role of incumbents in domestic credit markets. For example, China’s high deposit-to-GDP ratio co-exists with – or may even be partly explained by – financial repression and lack of domestic financial reform. Lastly, *de facto* financial development measures are likely to rise when capital inflows are buoyant, making the coefficient of *de jure* openness on *de facto* financial development endogenous if politicians prefer to liberalise in good times (Henry, 2007). Testing the interest group theory with *de jure* measures (which, as we acknowledge, have their own shortcomings<sup>3</sup>) is the first main innovation of this paper.

As our second key innovation – and an extension of the original interest group theory – we examine whether product market liberalisation has a positive effect on domestic financial liberalisation, over and above the one of openness. We see this as an important complement to the role of openness in the interest group theory, because product market reform can be expected to trigger domestic financial sector reform for the same reasons as trade liberalisation, by tilting the cost-benefit balance of financial liberalisation for incumbent firms: product market liberalisation is likely to increase the demand for external financing by creating new expansion opportunities; a need to invest to fend off new competitors; and lower profitability and thus reduced scope for internal financing of investment. We expect such an effect that undermines the status quo in favour of financial repression to be particularly

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<sup>1</sup> Tressel (2008) shows that trade reforms foster output growth in export sectors that rely more intensively on imported intermediated goods.

<sup>2</sup> Barlow and Radulescu (2005) examine the effect of *de jure* trade liberalisation on *de jure* domestic financial liberalisation, but only for a relatively limited sample of transition countries over a 10-year period.

<sup>3</sup> *De jure* measures do not capture the degree of enforcement of capital controls, which can change over time even if the legal restrictions themselves remain unchanged, and they do not always reflect the actual degree of integration of an economy into international capital markets. For example, China, despite extensive capital controls, has not been able to stop inflows of speculative capital (Kose et al., 2006).

pronounced for agriculture that in most developing countries constitutes the largest part of the population, electorate and economy. Indeed, Rajan and Ramcharan (2008) show that financial liberalisation is negatively affected by the importance of incumbent farmers, in line with the interest group theory.

If trade liberalisation follows, or is part of, a broader process of product market liberalisation, and we do not control for the latter, we risk attributing to openness an effect on domestic financial reforms that should be attributed to domestic product market policies. However, if we can confirm that *both* openness and product market deregulation positively affect domestic financial liberalisation, this strengthens the evidence in favour of the role of openness – and highlights an additional role of domestic product market liberalisation in the process of financial liberalisation that has not been examined so far.

We present evidence on the effect of trade, capital account and product market (in fact, agriculture, electricity and telecommunications) liberalisation on domestic financial liberalisation based on a new dataset on structural reforms, including yearly observations for 91 countries during 1973-2005. While this dataset obviously builds on existing indices and methodology, most of the data are entirely new, and our dataset is – to the best of our knowledge – the largest existing dataset on structural reforms in high-, middle- and low-income countries.

Our results provide further evidence in favour of the interest group theory as far as trade and domestic product market liberalisation are concerned. Trade liberalisation helps to predict domestic financial liberalisation as long as five years ahead. This result is robust to controlling for product market liberalisation. In contrast, there is little evidence that capital account liberalisation helps to predict domestic financial liberalisation beyond a one-year horizon, and even this effect is limited to its securities markets component. However, product market liberalisation is a robust leading indicator of domestic financial liberalisation at short and long horizons: specifically, agriculture liberalisation leads domestic financial liberalisation in low- and middle-income countries, and liberalisation of the energy and telecoms sectors has a positive significant effect at low levels of domestic financial liberalisation.

Our contribution adds to a rich literature that aims to explain the variation in financial development between countries and across time. Some of the main strands of the literature have focused on legal institutions (for example, La Porta et al., 1997; Claessens and Laeven, 2003), economic institutions (Acemoglu et al., 2005), endowments (Beck et al., 2000; Acemoglu et al., 2001), culture (Stulz and Williamson, 2003), social capital (Guiso et al., 2004), and macro factors such as inflation (Boyd et al., 2001) and public debt (Hauner, 2008).

Several studies have tested the effect of trade and financial openness on the liberalisation and development of the financial sector from various angles. Rajan and Zingales (2003) measured both openness (trade and capital flows) and financial development in *de facto* terms. Subsequent research has estimated the effects of *de jure* openness, specifically trade and capital account liberalisation, on *de facto* financial development (Baltagi et al., 2009; Chinn and Ito, 2006). In a study that is particularly closely related to our approach, Braun and Raddatz (2008) established that countries where trade liberalisation results in an increase in the relative strength of sectors that benefit from financial liberalisation experience faster subsequent financial development than others. This finding is essentially the micro (sector-level) complement of our macro (country-level) analysis here. The literature has also established that *de facto* trade openness leads to financial liberalisation (without distinction between domestic and capital account liberalisation, see Abiad and Mody, 2005) and equity market liberalisation (Kim and Kenny, 2007).

In the rest of the paper, Section 2 presents our novel dataset of structural reforms; Section 3 discusses the estimation strategy; Section 4 reports the results; and Section 5 concludes.

## 2. Data

We use a new dataset of indices of liberalisation in trade, capital account, the domestic financial sector and product markets – namely agriculture, electricity and telecommunications – with annual observations from 1973 to 2005 for 91 countries of all income levels, selected on the basis of data availability. In this paper we only briefly describe the data; see IMF (2009) for more detail.

Trade openness is measured by average tariff rates.<sup>4</sup> Our data are unique in that: (i) they cover a large sample of countries on an annual basis for more than three decades; (ii) the index is constructed to be comparable over time and across countries; and (iii) it offers a continuous measure of the level of liberalisation. The index provides an alternative to the widely used index by Sachs and Warner (1995) which has been criticised (Rodríguez and Rodrik, 2001) as dominated by information that is not necessarily capturing trade restrictions, namely the black market premium and the existence of an export marketing board. In our dataset, the presence of export marketing boards is more appropriately considered in the agriculture index (see below).

Financial openness is measured by qualitative indicators of restrictions on financial credits and personal capital transactions of residents and financial credits to non-residents, as well as the use of multiple exchange rates. Domestic financial liberalisation is measured by the simple average of six sub-indices: (i) credit controls, such as directed credit; (ii) interest rate controls, such as floors or ceilings; (iii) entry barriers in the banking sector, such as licensing requirements or limits on the participation of foreign banks; (iv) competition restrictions, such as limits on branches; (v) the degree of state ownership; and (vi) aggregate credit ceilings. These data come from the database by Abiad et al. (2010) which follows the methodology in Abiad and Mody (2005) but provides for a tripling of the information through greater coverage and an additional index for aggregate credit ceilings.<sup>5</sup>

Product market liberalisation is measured by two separate indices for the network industries and agriculture. The networks index is the simple average of the electricity and telecommunications markets sub-indices, which are constructed, in turn, from scores along three dimensions.<sup>6</sup> All these data, which were coded based on legislation, are entirely new and improve on the existing dataset not only in coverage, but also by including information on local services and interconnection charges, and by considering also the effective powers of regulators, not only their mere establishment.

Given that developing countries constitute most of our sample, the degree of regulation in agriculture, which continues to account for a large part of many of these economies, is an

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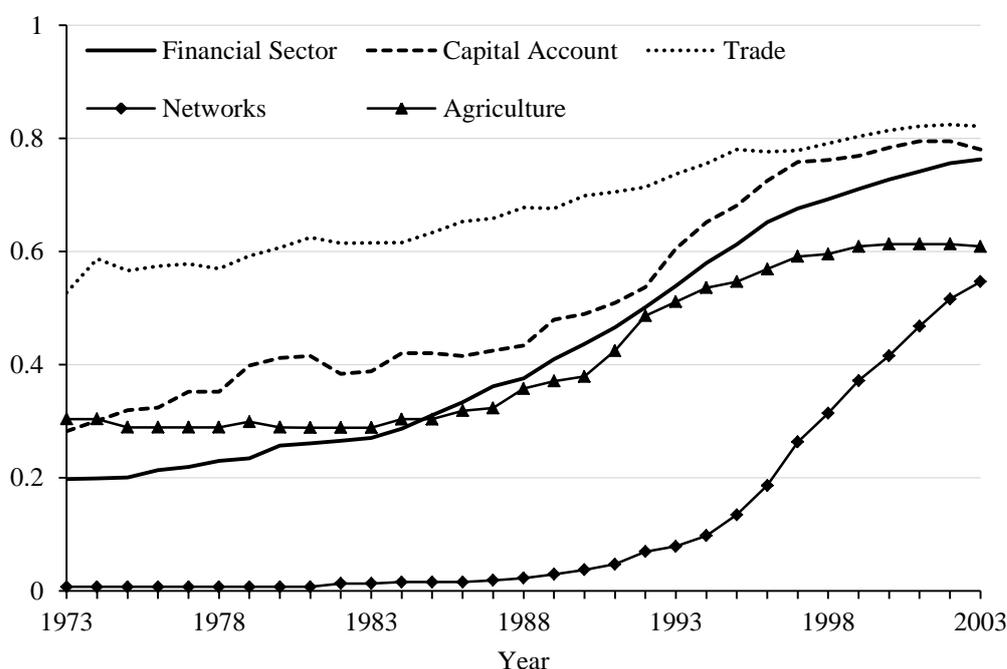
<sup>4</sup> Tariff rates come from various sources, including IMF, World Bank, WTO, UN and the academic literature (particularly Clemens and Williamson, 2004). The index uses average tariff rates when they are available and implicit weighted tariff rates to extrapolate the missing values. The index is normalised to be between zero and one: zero means the tariff rates are 60 per cent or higher, while one means the tariff rates are zero.

<sup>5</sup> As in Abiad and Mody (2005), the sub-indices are aggregated with equal weights. The original sources of the coded information are mostly various IMF reports and working papers, but also central bank web sites, etc. Each sub-index is coded from zero (fully repressed) to three (fully liberalised).

<sup>6</sup> For electricity, the sub-indices capture (i) the degree of unbundling of generation, transmission and distribution; (ii) whether a regulator other than government has been established; and (iii) whether the wholesale market has been liberalised. For telecommunications, they capture (i) the degree of competition in local services; (ii) whether a regulator other than government has been established; and (iii) the degree of liberalisation of interconnection changes. The indices are coded with values ranging from zero (not liberalised) to two (completely liberalised).

essential aspect of product market competition. Our entirely new index aims to capture intervention in the market for the main agricultural export commodity in each country.<sup>7</sup>

**Chart 1: Liberalisation in five sectors, 1973-2003**



Source: See Section 2.

Note: This chart shows the average level of liberalisation of the (domestic) financial sector, (external) trade, the networks industries (electricity and telecommunications), agriculture and the capital account, during 1973–2003. The average for each year includes all respectively available countries. All indices are normalised such that zero represents complete repression and one represents complete liberalisation.

In all cases, higher values represent greater liberalisation, and each index is standardised between zero and unity.<sup>8</sup> All indices trend upwards towards a high degree of liberalisation (Chart 1). The liberalisation process has been fairly gradual and steady in trade, capital account and the financial sector, while in the product markets most liberalisation has occurred since about 1990. There have never been global setbacks in the average degree of liberalisation. Note, however, that the level of liberalisation cannot be compared between the sectors, given that the indices build on different methodologies and are scaled differently; thus, one cannot conclude that, for example, trade is on average more liberalised than the financial sector.

Plotting domestic financial liberalisation against reforms in the other sectors provides a first intuition of the relationships we will examine econometrically. Chart 2 shows a few selected country cases, while the full range of charts is available on request. We selected countries that are representative of the econometric findings presented below. In India, significant trade

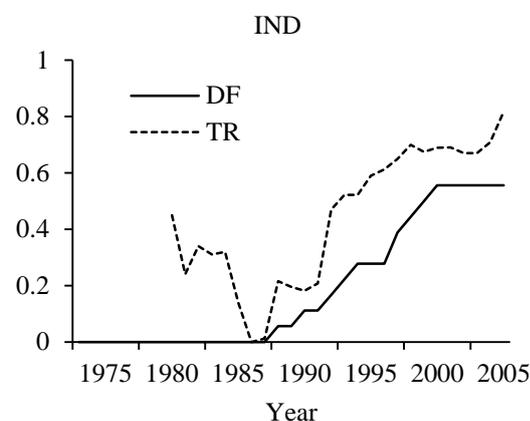
<sup>7</sup> As data limitations preclude coding separate dimensions of intervention, the index provides a summary measure of intervention, based on legislation and other official documents. Each country-year is assigned one of four degrees of intervention: (i) maximum (public monopoly or monopsony in production, transportation or marketing); (ii) high (administered prices); (iii) moderate (public ownership in relevant producers, concession requirements); and (iv) none.

<sup>8</sup> The sub-indices have been first standardised and then averaged to be aggregated. Note that we are not truncating but only rescaling the data. A small number of outliers that seemed to stem from data errors were removed.

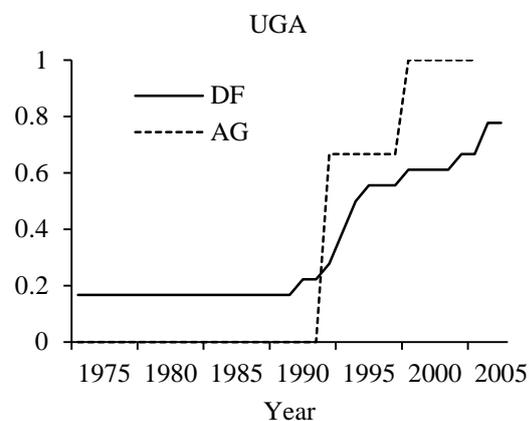
liberalisation during the mid-1980s to mid-1990s was followed by substantial domestic financial liberalisation within a few years. For Uganda, the chart suggests a similarly close relationship between agriculture and domestic financial liberalisation during the 1990s.

**Chart 2: Some cases of sequencing domestic financial liberalisation and other reforms**

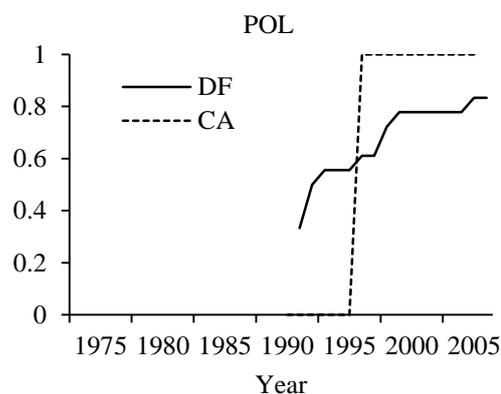
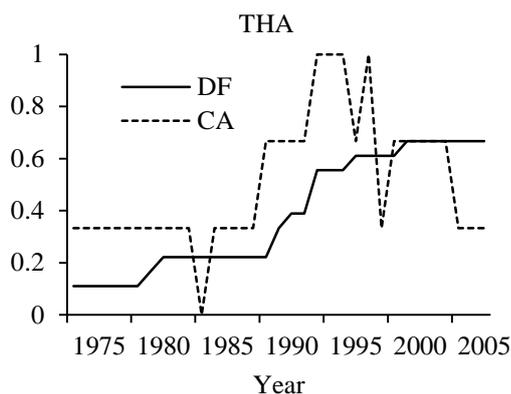
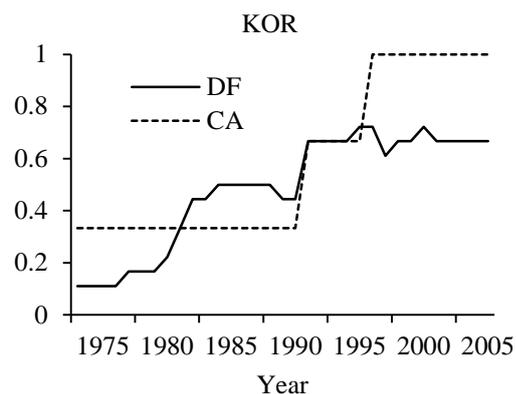
Trade liberalisation



Agriculture liberalisation



Capital account liberalisation



Source: See Section 2.

Note: This chart shows selected but representative country cases of the sequencing of domestic financial liberalisation and reforms in the other sectors included in our analysis. Specifically, the charts show the relationship with trade liberalisation in India, with agriculture liberalisation in Uganda, and with capital account liberalisation in Korea, Thailand, and Poland.

While the sequencing between trade and agriculture on the one hand and domestic financial sector on the other hand is comparatively homogenous, countries have chosen very different paths in the sequencing of domestic financial and capital account liberalisation: Korea kept its capital account fairly closed until 1990 while continuously liberalising the domestic financial sector during that period. In contrast, Thailand implemented substantial domestic financial liberalisation only after a rapid liberalisation of the capital account during the second half of the 1980s. Poland, finally, is an intermediate case: it started with liberalising the domestic financial sector, but then opened up the capital account extremely rapidly with the domestic financial sector catching up gradually.

Among the controls, GDP per capita is from the Penn World Tables (PWT6.1, series rgdpc). Commodities terms of trade are calculated for 32 commodities.<sup>9</sup> Among three measures of “distance” between countries, trade intensity (imports plus exports) comes from the World Integrated Trade Solution (WITS) database, military alliances from Johnson et al. (2007), and geographical distance from [www.cepii.fr/anglaisgraph/bdd/distances.htm](http://www.cepii.fr/anglaisgraph/bdd/distances.htm), respectively. As Giavazzi and Tabellini (2005) found that political reforms lead to economic reforms, we also include two controls of political liberalisation. The “Polity IV” score from [www.systemicpeace.org/polity/polity4.htm](http://www.systemicpeace.org/polity/polity4.htm) is a time-varying measure that captures the “concomitant qualities of democratic autocratic authority in governing institutions”, ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). In addition, we include the durability of a political regime from the same database to control for within-country stability and the time trend for reforms.

Tables 1 and 2 show the descriptive statistics as well as the mean values of the liberalisation indices by decade and by country group. Table 3 presents the correlations between the liberalisation indices. It seems likely that many of the sectors within a country get liberalised simultaneously, which points to a potentially high degree of correlation between the indices that could bias inference if the indices were included in the same regression.<sup>10</sup> However, the only pair of variables that has a correlation greater than 0.5 is that of trade and capital account liberalisation (0.57). To be sure, we estimated the impact of these variables individually in separate regressions in the specifications discussed below and found that our results are unchanged, thereby confirming that multicollinearity should not be a concern.

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<sup>9</sup> According to the formula  $TOT_{j,t} = \prod_i (P_{i,t} / MUV_t)^{X_{i,j}} / \prod_i (P_{i,t} / MUV_t)^{M_{i,j}}$ , where  $P_i$  is the price of commodity  $i$  from the IMF’s Commodity Price System,  $MUV$  is the manufacturing unit value index from the IMF’s World Economic Outlook database,  $X_{i,j}$  is the share of exports of commodity  $i$  in country  $j$ ’s total trade averaged over 1980–2001, and  $M_{i,j}$  is the share of imports of commodity  $i$  in country  $j$ ’s total trade averaged over 1980–2001. Export and import figures come from the World Integrated Trade Solution (WITS) database.

<sup>10</sup> To guard against any distortion in inference due to multicollinearity, we check the condition index and variance inflation factors (VIFs) for each of our explanatory liberalisation indices and confirm that none of them exceeds the rule-of-thumb value of 10. In fact, the maximum VIF is 2.99 and the mean VIF is 2.18.

**Table 1: Summary statistics for the variables used in the empirical analysis**

Variables	Number of observations	Mean	Standard Deviation	Minimum	Maximum
Domestic Financial Liberalisation	2673	0.477	0.303	0	1
Securities Markets	2673	0.497	0.376	0	1
Banking	2673	0.474	0.304	0	1
Directed Credit and Reserve Requirements	2673	0.511	0.382	0	1
Interest Rate Controls	2673	0.592	0.441	0	1
Entry Barriers and Pro-competition Measures	2673	0.590	0.393	0	1
Banking Supervision	2673	0.259	0.319	0	1
Banking Privatization	2673	0.416	0.396	0	1
Capital Account Liberalisation	2673	0.556	0.379	0	1
Trade Liberalisation	2521	0.707	0.239	0	1
Networks Liberalisation	2324	0.121	0.237	0	1
Agriculture Liberalisation	2197	0.422	0.391	0	1
Quinn's (1997) Index on Current Account Restrictions	1928	0.675	0.277	0.125	1
Polity Score	2876	2.924	7.161	-10	10
Durability of Regime (years)	2876	27	33	0	197
(log) GDP per capita	2617	8.609	1.047	5.900	10.460
(log) Commodities Terms of Trade	3028	4.610	0.181	3.804	6.112

**Table 2: Mean values for liberalisation indices by decades and country groups**

(a) Across Time					
	1970	1980	1990	2000	Total
Domestic Financial Liberalisation	0.214	0.313	0.589	0.757	0.477
Capital Account Liberalisation	0.333	0.419	0.652	0.788	0.556
Trade Liberalisation	0.571	0.639	0.756	0.824	0.707
Networks Liberalisation	0.007	0.016	0.160	0.487	0.121
Agriculture Liberalisation	0.295	0.314	0.526	0.612	0.422
(b) Across Income Groups					
	Low	Lower-middle	Upper-middle	High	Total
Domestic Financial Liberalisation	0.300	0.357	0.438	0.660	0.477
Capital Account Liberalisation	0.337	0.414	0.522	0.764	0.556
Trade Liberalisation	0.571	0.602	0.650	0.866	0.707
Networks Liberalisation	0.062	0.101	0.097	0.182	0.121
Agriculture Liberalisation	0.289	0.398	0.366	0.565	0.422

Note: This table provides the mean values for the indices of liberalisation in our new dataset by time and country groups. Income group classification follows the World Bank country groups by income.

**Table 3: Correlations among liberalisation indices**

	Domestic Financial Liberalisation	Capital Account Liberalisation	Trade Liberalisation	Networks Liberalisation	Agriculture Liberalisation
Domestic Financial Liberalisation	1				
Capital Account Liberalisation	0.728	1			
Trade Liberalisation	0.619	0.568	1		
Networks Liberalisation	0.573	0.437	0.338	1	
Agriculture Liberalisation	0.433	0.399	0.372	0.300	1

Source: Authors' calculations.

### 3. Estimation strategy

We estimate the following dynamic equation:

$$\begin{aligned} \Delta DF_{i,t} = & \alpha \cdot DF_{i,t-1} + \sum_k \beta_k \cdot y_{i,t-1}^k + \sum_l \gamma_l \cdot x_{i,t-1}^l + \sum_m \delta_m \cdot z_{i,t-1}^m \\ & + \xi_t + \eta_i + \sum_{j=1}^2 \phi_j \cdot \Delta DF_{i,t-j} + v_{i,t} \end{aligned} \quad (1)$$

where

$DF$  = domestic financial liberalisation;

$k = TR$  (trade),  $CA$  (capital account),  $AG$  (agriculture), and  $PR$  (energy, telecom) liberalisation;

$y_{i,t}^k$  = liberalisation index of sector  $k$  in country  $i$  in year  $t$ ;

$x_{i,t}^l$  = other determinants of reforms varying across countries and years;

$z_{i,t}^m$  = other determinants of reforms varying across countries and years;

$\xi_t$  = time effects;

$\eta_i$  = country effects;

$v_{i,t}$  = serially uncorrelated errors.

Our focus is on the parameters  $\alpha$  and  $\beta_k$  that measure the state dependence of the liberalisation within and across sectors. The parameter  $\alpha$  controls for the tendency of liberalisation levels to converge across countries. The more negative it is, the larger will be the gap between the pace of liberalisation of a country at a low level of liberalisation and that of a country at a high level of liberalisation, with the former being greater than the latter. We estimate the model in differences because, as Chart 1 demonstrates, there is strong autoregressive correlation in our panel.

Given the dynamic and feedback effects that characterise model (1), we cannot consider the regressors  $y_{i,t-1}$  strictly exogenous. However, in the absence of omitted variable bias (as well as other possible sources of endogeneity bias such as measurement error) and with serially uncorrelated errors thanks to including  $\sum_{j=1}^2 \phi_j \cdot \Delta y_{i,t-j}$ , the  $y_{i,t-1}$  are predetermined. Under these

assumptions, OLS estimates of the parameters in model (1) are consistent because the sequential moment restrictions hold and  $T$  is large (see Arellano, 2003, pp. 149–150).

However, if there were omitted variables correlated with the regressors, the  $y_{i,t-1}$  would not be predetermined but endogenous and the parameter estimates would no longer be consistent. At the same time, the risk of weak instrument bias implies that abandoning OLS for instrumental variable estimators is not costless. Thus, we present results for both OLS and instrumental variable estimators, specifically 2SLS and system GMM, as we will discuss shortly.

To reduce omitted variable bias, we control for year and country fixed effects that account for highly persistent characteristics such as institutions, property rights and the broad relative income level. However, we also present results without them because the interpretation of our parameters of interest  $\beta_k$  varies with  $\xi_i$  and  $\eta_i$ .<sup>11</sup> We also control for other lagged

determinants of reforms varying across countries and years,  $x_{i,t-1}^l$ , such as output per capita and commodities terms of trade, and other determinants of reforms varying across sectors, countries and years,  $z_{i,t}^m$ , such as political liberalisation. We also control for the liberalisation levels in the same sector of all other countries in the sample, averaged with weights based on three alternative measures of distance, as discussed in Section 2.

We cannot control, however, for one other potentially important source of omitted variable bias related to *domestic* omitted factors varying across countries and years that influence the timing of reforms: a reform-minded policy-maker may implement reforms according to a sequence dictated not by the desire to weaken interest group – in which case we would still be able to test whether some reforms were more effective than others in this respect – but because of constraints in “reform technology”. For example, some forms of capital account reform may be adopted earlier than trade liberalisation because they only require a change in regulation that the central bank or the government can introduce without the legislature, while tariff reductions need to be approved by parliament and may require an international agreement. In this case, although the political consensus to reform both the capital account and trade is possibly reached at the same time and there is no relevant information in the observed sequencing, we risk concluding that capital account liberalisation causes trade liberalisation. Similar spurious sequencing may emerge for any other factor leading to reform one sector before another in the presence of unchanged social and political support and no causal effect from one reform to the other.

To address such possible residual omitted variable bias, we adopt a three-pronged strategy to be able to make causal inferences. First, we run estimates on five-year intervals under the assumption that five-year lags of liberalisation indices are uncorrelated with current omitted time-varying liberalisation drivers at the country level. These long lags should take care of non-lasting omitted causes of spurious sequencing like those discussed in the previous paragraph.

Second, we use our weighted average levels of liberalisation in all other countries in the sample,  $z_{i,t}^m$ , as instrumental variables in 2SLS regressions. This identification strategy hinges on cross-border imitation of policies – which is well-established in the literature (Benmelech and Moskowitz, 2007; Giuliano et al., 2010; Simmons and Elkins, 2004) – as an exogenous source of variation. The identifying assumptions are that: (i) the rest of the world will not introduce reforms in response to those of any individual country; and (ii) imitation effects work only through same-sector reforms (that is, we impose the exclusion restriction that a capital account reform among neighbours makes the country more willing to liberalise the

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<sup>11</sup> For example, controlling for year fixed effects implies that the effect of a given liberalisation level  $y_{i,t-1}$  declines as time passes because all reforms trend upwards and, as a result, the difference of a given liberalisation level from the yearly mean diminishes as time goes by. However, it is not obvious that the effects of liberalisation should be assessed only in relative terms. Similarly, allowing for country dummies implies that we rely only on the within variation in the data to investigate whether one reform is conducive to another. While country dummies are important to control for unobservable invariant country specific effects correlated with the liberalisation indicators, they preclude us from using *between* country variation in the data for inference and, therefore, assessing whether countries with higher levels of liberalisation in one sector are more likely to reform another.

capital account but not other sectors). In other words, we achieve identification by excluding from each reform equation in (1) the  $z_{i,t}^m$  associated with the other reforms. Under the additional assumption that five-year-lags of liberalisation are predetermined, we use the over-identifying restriction test to verify instrument validity. To check for weak instruments, we inspect the first stage regressions and the Anderson's likelihood ratio.

Third, to check whether our results hold when the specification is estimated in levels, we use system GMM which allows for dynamics and thus can handle the serial correlation more easily. We use the five-year intervals here as annual data produce too many instruments and can weaken the Hansen over-identification test to the point that it becomes meaningless (Roodman, 2009). Indeed, dynamic GMM is primarily intended for panels with small T and large N.

Note that our identification strategy requires the assumption that any heterogeneity in the effects of liberalisation in other sectors is not correlated with domestic financial reforms.<sup>12</sup> This would fail if countries self-selected into domestic financial reforms based on the expected effect on another sector, for example, if many policy-makers had read Rajan-Zingales and believed that liberalising trade could be used as a means towards the end of domestic financial liberalisation.

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<sup>12</sup> See Persson and Tabellini (2007) for a broader discussion of this issue.

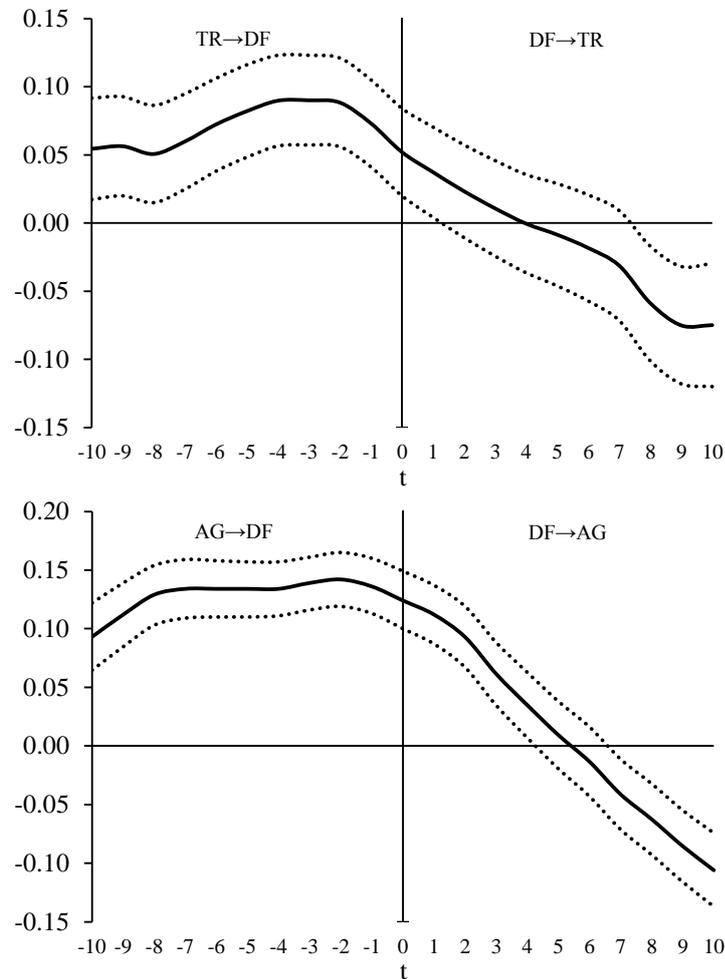
## 4. Results

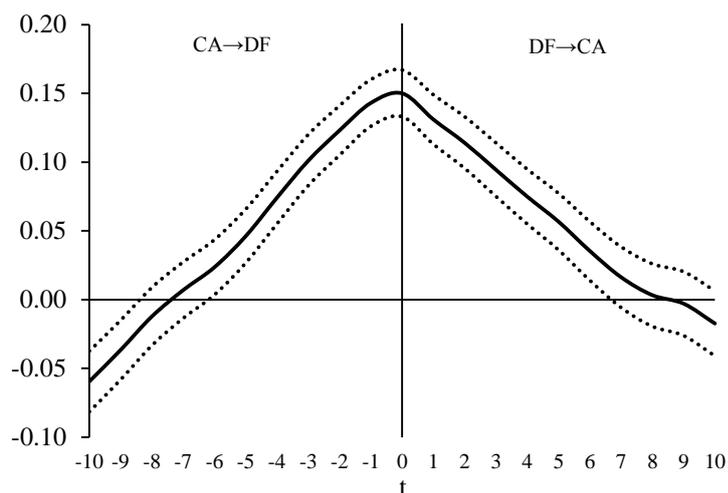
In this section, we present evidence supporting two main results. First, trade liberalisation is a robust leading indicator of domestic financial liberalisation at horizons as long as up to five years. Second, product market liberalisation is a robust leading indicator of domestic financial liberalisation at short and long horizons: specifically, agriculture liberalisation leads domestic financial liberalisation in low- and middle-income countries, and liberalisation of the energy and telecommunications sectors has a positive significant effect at low levels of domestic financial liberalisation.

### 4.1. Preliminary evidence

Before we delve into the regressions, we look at dynamic correlations between liberalisation in the domestic financial sector on the one hand and trade, capital account and agriculture on the other hand (Chart 3). We removed year and country fixed effects to avoid spurious correlations.

**Chart 3: Three key reforms: dynamic correlations**





Source: See Section 2.

Note: This figure shows dynamic correlations between domestic financial liberalisation and trade, agriculture, and capital account liberalisation, respectively, after removing country and year fixed effects. For example, the first chart shows that trade liberalisation is a leading indicator of domestic financial liberalisation because trade liberalisation during the 10 years before is consistently positively correlated with present-day domestic financial reform.

Trade and agriculture are leading indicators of domestic financial liberalisation, while the direction of the relationship with capital account liberalisation is more ambiguous. For example, the correlation between three-year-lagged trade and current domestic financial liberalisation is 0.12, and the correlation between third-year-lagged agriculture and current domestic financial liberalisation is 0.23, while the correlation between current domestic financial liberalisation and future trade and agriculture liberalisation is close to zero. In contrast, there is a closely symmetric relationship between domestic financial and capital account liberalisation. These impressions are reminiscent of the result of the following regressions.

## 4.2. Main findings

The regressions in Tables 4-6 that we will discuss here are based on about 1,500-1,700 observations for the annual intervals and about 250-350 for the five-year intervals. There is always strong convergence, with the coefficient on the lagged level of liberalisation in the same sector (own lagged level) negative and highly significant. In the annual regressions, the two lagged changes of the dependent variables are highly significant and successfully remove the serial correlation, as far as tests that include the lagged residual in the specification suggest.

The 2SLS regressions always pass the over-identifying restriction tests if we include year dummies. Thus, while our instruments based on neighbours' policies are correlated with the corresponding global reform-specific time trends – and cannot then be excluded from the second stage when we do not include reform-specific year dummies – they become valid instruments when the year dummies are included. The year dummies capture the global timing of each reform, while the instruments, which differ from the global trend only for the distance-based weighting scheme used to combine other countries' indices into a country-specific index of neighbours' reforms, capture additional country-specific imitation. The J-statistic confirms that the latter have a direct impact only on the corresponding sectoral reform but not on other sectors' reforms. Note also that, for each reform, we chose the instrument with the distance weighting scheme that yielded the highest correlation with the

corresponding sectoral liberalisation index, because the three distance-weighting schemes yield measures that are too correlated to be all included in the regression at the same time.<sup>13</sup> The Anderson likelihood ratio statistic and other standard tests on first-stage results, such as the Hausman et al. (2005) tests, confirm that the instruments are not weak.

Among the controls, the two democratisation scores are those relatively most influential. Though not consistently significant, they always have a positive sign, confirming the finding in the literature that political reforms lead to financial reforms. The commodities terms of trade and GDP per capita are significant only in a few regressions, and never at the 5 per cent level.

#### *4.2.1. Trade leads domestic financial liberalisation*

The top lines in Tables 4-6 document our first key result: trade liberalisation helps to predict domestic financial liberalisation. This effect is statistically significant across 24 regressions, whether we look at OLS regressions where the dependent variable is the one-year change (Table 4) or the five-year change (Table 5), or 2SLS regressions (Table 6). It holds irrespectively of whether we allow for a constant, year dummies, country dummies, or country and year dummies, and whether we do or do not include lagged GDP per capita and commodities terms of trade.

The size of the effects is substantial, considering that we control for year and country fixed effects, as well as several other factors: a one-standard-deviation increase in the trade liberalisation index increases the domestic financial development index by 0.10-0.15 standard deviations in the long run. In a real-world example, according to these estimates, Korea's trade liberalisation during the 1980s and 1990s would account for roughly 0.1 of the 0.5 point increase of the domestic financial liberalisation index during that period.

The statistical significance of trade liberalisation also in Table 5 which shows five-year intervals is an indication that the effects of trade liberalisation are long-lasting and not due to spurious cyclical fluctuations. Even several years after its occurrence, a step towards trade liberalisation is followed by more domestic financial reform than there would be without trade opening.<sup>14</sup> To the extent that domestic financial liberalisation is associated with financial development and the latter with higher growth, these findings are consistent with Quinn and Toyoda (2008), who have shown that current account liberalisation has a greater effect on growth than capital account liberalisation.

#### *4.2.2. Capital account leads domestic financial liberalisation only in short term*

The second line in Tables 4-6 shows the effect of capital account liberalisation on domestic financial reform. In the OLS regressions, the coefficient is significant at the 5 per cent level only in the annual estimates under the largest set of dummies and controls (column 8 of Table 4). At best, this would suggest a short-lived positive effect of capital account liberalisation on domestic financial reform. In the 2SLS and GMM regressions, capital account liberalisation enters with a consistently negative coefficient; though not highly statistically significant, this

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<sup>13</sup> Specifically, we used the weighting scheme based on geographical distance for the trade, capital account and agriculture indices, and trading partners for the networks index.

<sup>14</sup> The larger coefficients in the annual than in the five-year regressions are entirely due to the dynamic estimation and the different frequency. The long-run multipliers of the coefficients from each regression – obtained by dividing each coefficient by the coefficient on the own lagged level – are actually very similar. Also the larger explanatory power of the regressions on five-year intervals is due only in part to the fact that it might be easier to predict reforms over a five-year horizon than in any specific year. Most of the difference in the R-squared is, in fact, due to the greater explanatory power of time dummies in the five-year regressions.

would suggest that capital account liberalisation even constitutes an obstacle to domestic financial reform. This result holds also when we allow for a non-linear effect as we will discuss below.

These findings are also interesting to view against the background of increasing evidence that rapid financial liberalisation, particularly in the capital account, is often followed by boom-bust cycles (Kaminsky and Reinhart, 1999; Glick and Hutchinson, 2001), where the ensuing financial crises might then lead to a reversal of at least part of the earlier liberalisation, and that capital account liberalisation in the absence of a sufficiently reformed domestic financial sector increases volatility and crisis risk (Bekaert et al., 2006; Martin and Rey, 2006). Rousseau and Wachtel (2008) found that this effect reduces the benefits of financial development for growth. This empirical evidence is also in line with the argument in the earlier sequencing literature (Edwards, 1984; McKinnon, 1991) that as long as the domestic financial system is distorted by interest rate regulations and directed credit, it is pointless – indeed destructive – to allow capital mobility, because it would lead to capital flight that erodes the domestic deposit base or over-borrowing in foreign currency that is risky and would only be misallocated domestically.

#### *4.2.3. Product market leads domestic financial liberalisation*

The first result from including product market liberalisation we have already discussed: the effect of trade is robust to including it and thus has an autonomous effect on domestic financial reform. As a new key result, we also find conclusive evidence of a positive effect of agriculture liberalisation on domestic financial reform. Agriculture liberalisation has a highly significant positive coefficient no matter what dummies we include and what estimation method we apply. Estimating separate agriculture coefficients by income group (available on request), we find that the effect for low- and middle-income countries is bigger and more significant than that for high-income countries, as it could be expected in light of the respective role of the agriculture sector.

For the networks industries (energy and telecommunications), there is *prima facie* no consistent evidence of an effect on domestic financial reform. In the next subsection, we show, however, that this effect is positive and highly significant when domestic financial liberalisation is in its initial stages. We also find that the network industries coefficient becomes positive and significant when we allow for the significantly negative interaction between trade and networks liberalisation (available on request). In other words, trade and product market liberalisation are substitutes in determining domestic financial liberalisation. That is, when there is not much trade liberalisation, product market liberalisation has a positive effect on domestic financial reform. Given that both reforms would likely lead to greater product market competition, which is the channel through which the interest group theory foresees the shift in domestic political economy equilibrium occurring, their substitutability is consistent with Rajan and Zingales's hypothesis.

### **4.3. Extensions and robustness**

In this sub-section we present additional evidence on (1) sub-indices of domestic financial liberalisation; (2) non-linear effects; and (3) robustness to the use of alternative estimators.

#### *4.3.1. Primacy of securities markets liberalisation*

Our dataset allows us also to study the impact of trade liberalisation on the components of the domestic financial liberalisation index, distinguishing first between its banking and securities

markets components and then considering separately the five banking sub-indices. Table 7 shows that the impact of trade liberalisation on domestic financial liberalisation occurs primarily through securities markets liberalisation. Also the aforementioned negative impact of capital account liberalisation on domestic financial liberalisation occurs primarily through the securities markets component, rather than through the banking components.

#### 4.3.2. *Non-linear effect of networks liberalisation*

Liberalising other sectors may have a bigger impact on domestic financial liberalisation when the latter is in its initial stages than when it is well advanced. If so, parameters  $\beta_k$  in equation (1), which measure the state dependence of domestic liberalisation across sectors, should be a declining function of domestic financial liberalisation. Evidence of such non-linear effect would be a negative coefficient on the interaction between each sector's liberalisation index and the domestic financial liberalisation index and a positive direct effect of each index.<sup>15</sup>

As expected, Table 8 shows that the interaction term is negative for all types of reforms and at all frequencies. However, only in the case of networks liberalisation the non-linear specification uncovers a new result. While it had no significant positive effect in Tables 4-7, it now has a positive and highly significant direct coefficient with a highly negative and significant interaction term in the annual interval regressions, suggesting strong effects of networks liberalisation at low levels of domestic financial liberalisation (column 7 in Table 8).

#### 4.3.3. *Alternative estimators*

We applied alternative estimators to check two potential issues. First, to ensure the robustness of our system GMM results in the five-year interval regressions, we estimate them with difference GMM and with various lag lengths as instruments. We find again that trade and agriculture liberalisation have a highly significantly positive effect on domestic financial liberalisation, while there is no significant effect from capital account liberalisation. Second, although we are not actually truncating the data (see Section 2), to be sure that the [0,1] bounds on our indices do not bias our conclusions, we run all regressions with the maximum likelihood estimator assuming a truncated distribution, and results are unchanged.<sup>16</sup>

#### 4.3.4. *Other extensions*

The results of several further extensions are available on request. First, we replaced in the regressions of Tables 4–6 the capital account liberalisation index we used so far with Quinn's (1997) index (extended to 2005, available for about 60 countries) to verify whether our weak results about the effects of capital account liberalisation might depend on the index we use. Quinn's overall index is not significant in all our regressions, failing to confirm even the short-term leading indicator effect we had detected with our index.

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<sup>15</sup> A non-linear specification may unveil the effect of reforms that tend to take place later in the sample and, therefore, at relatively high levels of domestic financial liberalisation. For these reforms, in a simple linear specification, the preponderance of observations where there is no scope for further domestic financial liberalisation may obscure a potential positive role in the early stages of domestic financial liberalisation. Moreover, a negative interaction term could also be considered a sign that reforms in other sectors could accelerate the speed of convergence to the steady state level of domestic financial sector liberalisation. According to this alternative interpretation,  $\beta_{DF,DF}$  (the convergence term) would be a negative function of reforms in other sectors.

<sup>16</sup> See Simar and Wilson (2007) for a discussion of truncation issues arising from a finite number of observations.

We also explored the potential effect of the interaction between trade and capital account liberalisation on domestic financial reform. In a strict interpretation of Rajan and Zingales's interest group theory, a combination of trade and capital account liberalisation should have a greater impact than each of them separately, as discussed in Section 1. However, the estimated interaction term is not statistically significant.

## **5. Conclusions**

We have provided a new test of the interest group theory of financial development based on regulation. Moreover, we have suggested and tested an extension to the theory in that product market liberalisation may have similar effects on financial liberalisation as stipulated for trade by Rajan and Zingales (2003) by shifting the relative costs and benefits of financial liberalisation for incumbents. In doing so we have for the first time examined the sequencing of trade, product market, capital account and domestic financial liberalisation for an encompassing country panel.

Our findings support the primacy of trade implied by Rajan and Zingales's (2003) interest group theory: trade liberalisation is a significant leading indicator of domestic financial liberalisation. However, we do not find evidence in favour of the view that capital account liberalisation – or its interaction with trade – is a leading indicator of domestic financial liberalisation. Our additional new result that product market liberalisation is a leading indicator of domestic financial reform is consistent with Rajan and Zingales's view that the opposition of interest groups to domestic financial liberalisation weakens as product markets become more competitive.

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**Table 4. OLS regressions of financial liberalisation, annual intervals**

Variable	Constant		Year Dummies		Country Dummies		Country, Year Dummies	
	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>
Trade liberalisation (-1)	0.0306*** 4.23	0.0312*** 4.21	0.0283*** 4.10	0.0267*** 3.77	0.0565*** 5.07	0.0541*** 4.82	0.0317*** 2.95	0.0324*** 3.02
Capital account liberalisation (-1)	0.0027 0.48	0.0047 0.83	0.0062 1.16	0.0056 1.00	0.0121* 1.72	0.014* 1.93	0.0095 1.40	0.0136** 1.97
Agriculture liberalisation (-1)	0.0051 1.45	0.0055 1.55	0.0080** 2.28	0.0079** 2.25	0.0291*** 3.38	0.0262*** 3.05	0.0263*** 3.18	0.0213** 2.56
Networks liberalisation (-1)	-0.0024 -0.54	-0.0036 -0.81	-0.0049 -0.94	-0.0048 -0.92	-0.002 -0.32	-0.0035 -0.53	-0.0005 -0.07	-0.0078 -1.06
Neighbour DF (Alliance weights) (-1)	0.0114*** 3.12	0.0118*** 3.17	0.0104** 2.24	0.0090* 1.94	0.0216*** 4.56	0.0199*** 4.21	0.0274*** 3.92	0.0247*** 3.56
Polity score (-1)	0.0003 1.22	0.0004* 1.74	0.0003 1.34	0.0002 0.88	0.0013*** 2.79	0.0014*** 2.93	-0.0001 -0.19	0.0004 0.03
Regime durability (-1)	0.0000 0.62	0.0000 1.07	0.0001*** 2.63	0.0001** 2.09	0.0006*** 3.39	0.0006*** 3.13	0.0000 -0.08	0.0001 0.72
GDP per capita (-1)		-0.0025 -1.20		0.0019 0.87		-0.0012 -0.15		-0.0263*** -3.11
Commodities terms of trade (-1)		-0.0082 -1.44		-0.0075 -1.31		-0.0272** -2.35		-0.016 -1.45
Own lagged level (-1)	-0.0477*** -6.34	-0.0469*** -6.18	-0.0765*** -8.79	-0.0779*** -8.63	-0.0957*** -7.73	-0.0954*** -7.72	-0.1710*** -10.82	-0.1717*** -10.81
Dependent variable (-1)	0.1212*** 4.40	0.1164*** 4.19	0.0970*** 3.57	0.0972*** 3.54	0.1156*** 4.19	0.1122*** 4.08	0.1177*** 4.34	0.1116*** 4.15
Dependent variable (-2)	0.0839*** 2.83	0.0828*** 2.76	0.0658** 2.25	0.0694** 2.35	0.0786** 2.56	0.0796*** 2.58	0.0851*** 2.86	0.0822*** 2.77
R-squared	0.062	0.064	0.127	0.127	0.108	0.110	0.191	0.196
Adjusted R-squared	0.057	0.057	0.108	0.106	0.062	0.064	0.136	0.14
Number of observations	1738	1728	1738	1728	1738	1728	1738	1728

Note: This table reports OLS regressions of the change in domestic financial liberalisation with annual data. In columns labelled “basic,” the independent variables are the lagged liberalisation in the other four sectors, the weighted level of financial liberalisation in other countries, polity score, regime durability, own lagged level (of financial liberalisation) to control for convergence, and two lags of the dependent variable to account for serial correlation. In the columns labelled “controls”, the regressions also include per capita income and the commodities terms of trade. We report regressions including only a constant, year, country and combined year and country dummies to allow for various fixed effects. T-statistics are reported below the coefficient. \*\*\*, \*\*, \* mean significant at 1, 5, and 10 per cent, respectively.

**Table 5. OLS regressions of financial liberalisation, five-year intervals**

Variable	Constant		Year Dummies		Country Dummies		Country, Year Dummies	
	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>
Trade liberalisation (-1)	0.1385*** 4.07	0.1337*** 3.59	0.1266*** 4.55	0.1156*** 3.74	0.1972*** 4.29	0.1844*** 3.27	0.106*** 2.74	0.0979** 1.99
Capital account liberalisation (-1)	-0.0371 -1.19	-0.0397 -1.11	-0.0157 -0.58	-0.0267 -0.84	-0.0208 -0.56	-0.0123 -0.27	-0.0302 -0.96	-0.0177 -0.44
Agriculture liberalisation (-1)	0.0209 1.16	0.0201 0.93	0.0360** 2.22	0.0354* 1.78	0.1154** 2.87	0.1333** 2.36	0.1154*** 3.43	0.0964** 2.19
Networks liberalisation (-1)	-0.0493** -2.38	-0.0187 -0.45	-0.0211 -0.87	-0.0206 -0.47	-0.075** -2.57	-0.0954 -1.52	-0.0023 -0.07	-0.0220 -0.35
Neighbour DF (Alliance weights) (-1)	0.0535*** 2.74	0.0887*** 3.00	0.0338* 1.86	0.0427 1.56	0.1327*** 3.25	0.1843*** 2.87	0.1009*** 2.84	0.1049* 1.79
Polity score (-1)	0.0019* 1.72	0.0031** 2.10	0.0019* 1.93	0.0013 1.06	0.0067** 2.93	0.0086** 3.10	0.0009 0.50	0.0018 0.88
Regime durability (-1)	0.0001 0.83	0.0002 0.79	0.0004** 2.40	0.0005** 1.98	0.0028*** 2.75	0.0031* 1.79	-0.0001 -0.11	0.0001 0.09
GDP per capita (-1)		-0.0029 -0.87		0.0043 1.37		0.0154 0.95		-0.0211 -1.55
Commodities terms of trade (-1)		-0.0104 -0.92		-0.0121 -1.15		-0.0357* -1.70		-0.0132 -0.71
Own lagged level (-1)	-0.1971*** -5.07	-0.1784*** -3.72	-0.3228*** -7.48	-0.3688*** -6.56	-0.4033*** -6.38	-0.4317*** -4.90	-0.6937*** -9.45	-0.7706*** -8.29
R-squared	0.170	0.140	0.370	0.350	0.340	0.350	0.580	0.590
Adjusted R-squared	0.150	0.100	0.350	0.320	0.140	0.090	0.440	0.410
Number of observations	353	278	353	278	353	278	353	278

Note: This table reports OLS regressions of the change in domestic financial liberalisation with five-year intervals. The interval aside, the structure of the regressions is the same as in Table 4, except that no lagged dependent variables are needed given the greater intervals. T-statistics are reported below the coefficient. \*\*\*, \*\*, \* mean significant at 1, 5, and 10 per cent, respectively.

**Table 6. 2SLS regressions of financial liberalisation, annual intervals**

Variable	Constant		Year Dummies		Country Dummies		Country, Year Dummies	
	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>	<i>Basic</i>	<i>Controls</i>
Trade liberalisation (-1)	0.0324*** 3.20	0.0304*** 3.00	0.0292*** 2.97	0.0261*** 2.65	0.0855*** 4.36	0.0778*** 3.88	0.0373** 1.98	0.0331* 1.72
Capital account liberalisation (-1)	-0.0188 -1.54	-0.0141 -1.10	-0.0122 -1.06	-0.016 -1.28	-0.0222 -0.92	-0.0205 -0.73	-0.0435* -1.78	-0.0278 -1.04
Agriculture liberalisation (-1)	0.0017 0.41	0.0015 0.35	0.0054 1.33	0.0054 1.33	0.0411*** 2.72	0.0416*** 2.72	0.0399*** 2.58	0.0351** 2.24
Networks liberalisation (-1)	0.0009 0.14	0.0007 0.11	-0.0101 -1.37	-0.0097 -1.30	0.0165 1.37	0.0185 1.57	-0.0133 -0.72	-0.0208 -1.10
Neighbour DF (Alliance weights) (-1)	0.0126*** 3.22	0.012*** 3.11	0.0124** 2.51	0.0099** 2.03	0.0255*** 4.56	0.0251*** 4.43	0.0293*** 3.81	0.0273*** 3.61
Polity score (-1)	0.0005** 2.09	0.0005** 1.96	0.0005** 2.21	0.0003 1.39	0.0013*** 2.83	0.0014*** 2.88	-0.0003 -0.75	-0.0001 -0.32
Regime durability (-1)	0.0000 0.58	0.0000 0.42	0.0001** 2.34	0.0001 1.50	0.0006*** 2.94	0.0005** 2.51	0.0000 0.20	0.0002 0.89
GDP per capita (-1)		0.0001 0.06		0.0044* 1.87		0.003 0.28		-0.024** -2.10
Commodities terms of trade (-1)		-0.0118* -1.74		-0.0119* -1.77		-0.0234* -1.72		-0.0152 -1.13
Own lagged level (-1)	-0.0351*** -3.26	-0.0382*** -3.55	-0.0596*** -5.55	-0.0631*** -5.87	-0.1055*** -4.83	-0.1079*** -4.78	-0.1545*** -7.02	-0.1619*** -7.12
Dependent variable (-1)	0.1284*** 4.33	0.128*** 4.26	0.1041*** 3.57	0.1086*** 3.68	0.1319*** 4.38	0.1323*** 4.36	0.1285*** 4.35	0.121*** 4.15
Dependent variable (-2)	0.082** 2.51	0.0831** 2.53	0.0601* 1.91	0.0663** 2.09	0.0937*** 2.88	0.0956*** 2.90	0.0903*** 2.89	0.0853*** 2.76
R-squared	0.057	0.062	0.121	0.121	0.097	0.103	0.168	0.191
Adjusted R-squared	0.051	0.055	0.099	0.098	0.045	0.050	0.103	0.127
Number of observations	1524	1518	1524	1518	1524	1518	1524	1518
Hansen J statistic (p-value)	0.000	0.000	0.135	0.184	0.000	0.000	0.333	0.402
Anderson LM statistic (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: This table reports 2SLS regressions of the change in domestic financial liberalisation with annual intervals. The estimator aside, the structure of the regressions is the same as in Table 4. All liberalisation variables are treated as endogenous; each endogenous variable is instrumented by a weighted degree of the corresponding liberalisation level in other countries and a five-year lag of its own level. T-statistics are reported below the coefficient. \*\*\*, \*\*, \* mean significant at 1, 5, and 10 per cent, respectively.

**Table 7. 2SLS regressions of financial liberalisation, sub-indices, annual intervals**

	Dependent Variable							
	DF	SM	BK	DCRQ	INTC	EBCM	BKSP	PRIV
Trade liberalisation (-1)	0.0373** 1.98	0.0970*** 2.66	0.0308 1.49	0.0633 1.42	0.0541 0.91	0.0619 1.56	-0.0124 -0.34	0.0295 0.61
Capital account liberalisation (-1)	-0.0435* -1.78	-0.0769** -2.10	-0.0428 -1.51	-0.0925 -1.58	-0.0791 -1.10	-0.0427 -0.95	-0.0003 -0.01	-0.0449 -0.87
Agriculture liberalisation (-1)	0.0399*** 2.58	0.0091 0.41	0.0494*** 2.72	0.0239 0.67	0.0352 0.79	0.0418 1.21	0.0677** 2.47	0.1050*** 3.08
Networks liberalisation (-1)	-0.0133 -0.72	-0.0482 -1.60	-0.0076 -0.36	0.0182 0.43	-0.0456 -0.97	-0.0795** -2.24	0.0741 1.51	-0.0076 -0.19
Neighbour DF (Alliance weights) (-1)	0.0293*** 3.81	0.0169 1.40	0.0348*** 3.90	0.0793*** 4.45	0.057** 2.47	0.017 1.02	0.0332* 1.86	0.0309 1.48
Polity score (-1)	-0.0003 -0.75	0.0008 0.98	-0.0006 -1.19	0.0001 0.12	0.0004 0.27	-0.0023** -2.26	-0.0013* -1.93	-0.0012 -1.41
Regime durability (-1)	0.0000 0.20	0.0001 0.16	0.0000 0.15	-0.0001 -0.26	-0.0001 -0.14	-0.0003 -0.52	0.0003 0.83	0.0002 0.59
Own lagged level (-1)	-0.1545*** -7.02	-0.1786*** -6.27	-0.1662*** -7.31	-0.1838*** -7.82	-0.2471*** -7.43	-0.1706*** -7.31	-0.2284*** -8.67	-0.1749*** -5.31
Dependent variable (-1)	0.1285*** 4.35	0.0277 1.34	0.1063*** 3.90	0.0475* 1.95	0.0678*** 2.68	0.0351 1.46	-0.0318 -1.43	0.0134 0.47
Dependent variable (-2)	0.0903*** 2.89	0.0361 1.41	0.0739*** 2.36	0.0419 1.63	0.0292 0.92	0.0658*** 2.58	-0.0198 -0.88	0.0368 1.04
R-squared	0.168	0.086	0.168	0.100	0.178	0.139	0.172	0.120
Adjusted R-squared	0.103	0.015	0.103	0.030	0.114	0.072	0.108	0.051
Number of observations	1524	1524	1524	1524	1524	1524	1524	1524
Hansen J statistic (p-value)	0.333	0.090	0.609	0.008	0.107	0.492	0.343	0.893
Anderson LM statistic (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: This table reports 2SLS regressions of the change in domestic financial liberalisation with annual data. The first column replicates the second-last column of Table 6, while the other columns replace, respectively, DF with the seven sub-indices of our financial liberalisation index. These sub-indices are securities markets (SM) and banking (BK) which, in turn, are split into directed credit and reserve requirements (DCRQ), interest rate controls (INTC), entry barriers and pro-competition measures (EBCM), banking supervision (BKSP) and banking privatisation (PRIV). All regressions include country and year fixed effects. T-statistics are reported below the coefficient. \*\*\*, \*\*, \* mean significant at 1, 5, and 10 per cent, respectively.

**Table 8. 2SLS and GMM regressions of financial liberalisation, non-linear effects**

Variable	1-Year	5-Year	1-Year	5-Year	1-Year	5-Year	1-Year	5-Year
Trade liberalisation (-1)	0.0687*** 3.35	0.3080*** 3.55	-0.0177 -0.76	0.2272*** 3.13	0.0272 1.25	0.1799*** 2.45	-0.0088 -0.38	0.2163*** 3.68
TR <sub>t-1</sub> * DF <sub>t-1</sub>	-0.2341*** -3.77	-0.3498 -1.55						
Capital account liberalisation (-1)	-0.0561** -2.16	0.0094 0.29	0.0435 1.56	0.0202 0.30	-0.0553** -2.09	0.0038 0.09	-0.0547** -2.16	0.0134 0.37
CA <sub>t-1</sub> * DF <sub>t-1</sub>			-0.1575*** -4.69	-0.0363 -0.37				
Agriculture liberalisation (-1)	0.0336** 2.05	0.0712 1.41	0.0303** 1.80	0.0667 1.51	0.0978*** 3.22	0.1573** 2.49	0.0388*** 2.47	0.0849** 2.09
AG <sub>t-1</sub> * DF <sub>t-1</sub>					-0.1141** -2.01	-0.1644 -1.54		
Networks liberalisation (-1)	0.0000 0.00	-0.0602 -1.25	0.0040 0.20	-0.0724 -1.62	0.0122 0.52	-0.074 -1.51	0.1954*** 3.26	-0.0481 -0.25
NW <sub>t-1</sub> * DF <sub>t-1</sub>							-0.2374*** -4.02	-0.0393 -0.19
Neighbour DF (Alliance weights) (-1)	0.0212*** 2.65	-0.031 -0.67	0.0235*** 3.05	0.0116 0.28	0.0306*** 3.95	-0.0198 -0.66	0.0267*** 3.44	-0.0016 -0.04
Polity score (-1)	-0.0006 -1.15	0.0050** 2.12	-0.0005 -1.04	0.0050** 2.15	0.0004 0.75	0.0045* 1.75	-0.0008 -1.60	0.0046** 2.11
Regime durability (-1)	-0.0001 -0.40	0.0010* 1.86	0.0000 0.13	0.0003 0.70	0.0002 1.07	0.0006 1.39	0.0000 -0.10	0.0005* 1.70
Own lagged level (-1)	0.0213 0.40	-0.2811* -1.71	-0.0775*** -2.67	-0.5180*** -6.37	-0.097** -2.57	-0.4357*** -6.26	-0.1479*** -6.82	-0.5225*** -7.75
Dependent variable (-1)	0.1136*** 3.75		0.1134*** 3.85		0.1261*** 4.23		0.1373*** 4.53	
Dependent variable (-2)	0.0705** 2.21		0.0696** 2.23		0.0872*** 2.80		0.0866*** 2.78	
R-squared	0.142		0.169		0.142		0.153	
Adjusted R-squared	0.075		0.104		0.074		0.086	
Number of observations	1524	353	1524	353	1524	353	1524	353
Hansen J statistic (p-value)	0.446	0.967	0.701	0.936	0.109	0.934	0.872	0.978
Anderson LM statistic (p-value)	0.000		0.000		0.000		0.000	
Arellano-Bond AR1 test (p-value)		0.000		0.000		0.000		0.000
Arellano-Bond AR2 test (p-value)		0.840		0.693		0.649		0.723

Note: This table replicates the second-last column of Table 6 with one- and five-year intervals but allowing the effects of liberalisation in all other sectors on financial liberalisation to vary by the attained level of financial liberalisation. Regressions with annual data are estimated with 2SLS and regressions with five-yearly interval data are estimated with GMM. T-statistics are reported below the coefficient. \*\*\*, \*\*, \* mean significant at 1, 5, and 10 per cent, respectively.