

Financial Integration Thresholds for Consumption Risk-Sharing

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Abstract

I present empirical evidence of how international consumption risk sharing varies by levels of financial integration. In a panel data set of 64 countries from 1985–2007, I show a significant presence of threshold effects of financial integration on international consumption risk sharing. For various measures of financial integration, I estimate threshold levels, confidence intervals and coefficients of consumption risk sharing directly from the data. The results indicate the presence of two significant thresholds and three corresponding regimes. Below the lower threshold there is limited but statistically significant consumption risk-sharing. Above the higher threshold there is significant risk-sharing. However, intermediate to the two thresholds there is a regime with excess volatility. These findings are therefore suggestive of a *U*-shaped relationship between financial integration and consumption risk-sharing, with a potentially destabilizing intermediate regime.

Key words: financial integration, consumption risk-sharing, threshold effects

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1 Introduction

Over the past three decades there has been a large increase globally in the stock of cross-border financial capital holdings, especially in emerging and developing economies. In theory, such financial integration should promote international consumption risk-sharing. Cross-border financial linkages can decouple domestic consumption from country specific components of output shocks, thereby decreasing the correlation between domestic consumption and output, and increasing the correlation between domestic consumption and world consumption. However, the empirical evidence on the relationship between financial integration and international consumption risk-sharing is mixed. Existing research suggests that risk-sharing has not increased much, especially in emerging economies, despite the wave of financial globalization. In fact, there is some evidence that greater financial integration can also increase the correlation between domestic consumption and domestic output, and can even lead to excess volatility (i.e., *negative* consumption risk-sharing).¹

The puzzling empirical relationship between financial integration and international consumption risk-sharing has led some people to posit the existence of a *threshold effect*, whereby consumption risk-sharing is achieved only after a certain degree of financial integration is reached (see, e.g., Kose et al. (2007, 2009b)). In this paper, I test for the existence of such threshold effects in a panel data set of 64 countries from 1985 – 2007. I estimate thresholds by adapting a method for threshold estimation developed by Hansen (1999) for balanced panels. The methodology allows for estimation of thresholds, confidence intervals and standard errors directly from the data, and thereby eschews an ad-hoc categorization of countries based on GDP per capita (versus the actual measures of financial integration of interest). To implement the methodology empirically, I proxy financial integration by various quantity-based financial-integration measures,² and measure consumption

¹See, for example, recent work by Kose et al. (2003, 2007, 2009b); Bai and Zhang (2012).

²There exist two types of measures of financial integration. The first type are *de jure* measures that attempt to capture legal restrictions on cross-border capital flows (see Edwards (2001); Chinn and Ito (2008); Quinn (1997); Edison et al. (2002)). The second type are *de facto* measures that are based on actual cross-border capital stocks, and include the positive sum of items in the capital

risk-sharing in terms of the coefficient on the annual country-specific consumption growth rates against country-specific output growth rates in a panel controlling for individual (and time) fixed-effects (Demyanyk et al., 2008; Kose et al., 2007).

I find that economies with highly integrated capital markets have fostered imperfect but better risk-sharing than countries with less integrated capital markets. More formally, the results show that financial integration when measured using either (1) the sum of gross total foreign direct investment (FDI) and foreign portfolio investment (FPI) (as a ratio of GDP) (henceforth equity volume), or (2) total foreign assets and liabilities (to GDP) (henceforth total volume), reveal two significant thresholds corresponding to three regimes. The first regime is characterized by a lower threshold value of financial integration (e.g., the estimated threshold level in the case of equity volume to GDP as the financial integration measure is approximately 57.9%). Country-year pairs falling in this regime evidence statistically significant and positive but economically small international consumption risk-sharing. In the third regime (e.g., the estimated level of threshold for equity volume to GDP \approx 92.2%), country-year pairs' risk-sharing remains imperfect but is both statistically and economically significant, with an average consumption risk-sharing coefficient of 54% (Coefficient of 0 corresponds to perfect consumption risk-sharing, while a coefficient of 1 indicates no consumption risk-sharing). However, intermediate to the two thresholds there is a regime with excess volatility, where average country-specific consumption growth rates *exceed* country-specific output growth rates. These findings are therefore suggestive of a *U*-shaped relationship between financial integration and consumption risk-sharing, with a potentially destabilizing intermediate regime.

Confidence intervals around the threshold levels accompany the above threshold estimates. These confidence regions are tight, and results remain significant across the confidence regions. Qualitative results are also robust to alternative measures of financial integration. The estimation of tight confidence intervals is important for making policy conclusions, since one implication of the results is that the effect

account viewed relative to GDP. Quantity based measures provide a less volatile and a more appropriate measure of integration for studying risk-sharing phenomenon (see, e.g., Kose et al. (2009a) for a discussion of the favorability of such measures in the context of consumption risk-sharing).

of financial integration on consumption risk-sharing is non-linear, with the second regime showing no benefit in terms of consumption risk-sharing. Such a regime can potentially be destabilizing for fragile economies, indicating that there are potential upfront costs of financial integration that are turned into benefits only after integration into international capital markets has proceeded far enough. Tight confidence intervals around the threshold estimates indicate that intermediate regime 2 is quite large with a transition from the first to the third regime requiring an increase, for example, of 40% of gross FDI and FPI relative to GDP. Therefore, the intermediate regime may hinder economies' ability to achieve international consumption risk-sharing through financial integration.

The finding of significant threshold effects also suggest a nuanced approach to interpreting the empirical relationship between financial integration and consumption risk-sharing more generally. In the existing literature, patterns of consumption risk-sharing are generally studied using simple, linear interaction of idiosyncratic component of output with measures of financial integration, or using separate estimates for subsamples of developing, emerging or industrial economies. Threshold effects, however, indicate the presence of statistically significant non-linearity in the relationship between financial integration and risk-sharing. Such non-linearities are consistent with the mixed findings in the existing literature, but suggest an alternative rationale whereby economies face an intermediate hurdle on the path of financial integration before benefits of consumption risk-sharing are realized.

The remainder of the paper is structured as follows. Section 2 discusses related literature. Section 3 outlines the data set and Section 4 provides details on the empirical methodology. Section 5 presents the results and Section 6 provides additional discussion. Section 7 concludes. Appendix A and B contain additional tables and robustness checks.

2 Related Literature

There is a large literature on consumption risk-sharing in industrialized economies. The consensus from this literature is that risk-sharing in industrialized economies is imperfect (Backus et al., 1992; Canova and Ravn, 1996; Pakko, 1998; Ambler et al., 2004), but has improved significantly with greater integration of financial markets (Lewis, 1996; Obstfeld, 1994; Pakko, 1998; Demyanyk et al., 2008).³

More recently, there has also been a focus on consumption risk-sharing in emerging economies. Kose et al. (2003, 2007, 2009b) and Bai and Zhang (2012) show that, relative to industrialized countries, consumption risk-sharing in emerging economies is (1) small and, (2) appears much less responsive to an increase in financial market integration. Kose et al. (2003, 2007) employ a variety of measures of consumption risk-sharing for 72 economies for the sample period 1960–2004. They divide the full sample of these countries into three sub-groups: advanced countries (21), emerging markets (22) and other developing countries (33). They conclude that advanced economies have achieved more consumption risk-sharing during the sample period. Similarly, Bai and Zhang (2012) find that the coefficient estimated by regressing domestic consumption growth on domestic output growth is lower and the coefficient of domestic consumption growth on world consumption growth is higher for the industrialized countries than for emerging economies, suggesting greater risk-sharing in the developed economies. This puzzling non responsiveness of consumption risk shar-

³Backus et al. (1992); Canova and Ravn (1996); Ambler et al. (2004) all study cross-country consumption correlations in industrialized countries and reach the conclusion that risk-sharing remains low relative to the predictions of a standard Arrow-Debreu contingent claims economy. Lewis (1996) also documents that data reflects consumption growth rates of countries with higher financial integration covary less strongly with domestic output variations relative to the world than less financially integrated economies. Obstfeld (1994) specifically uses a sample of G-7 countries for the period 1950-1988 and concludes that for both cross-country consumption growth correlations and the correlation between domestic consumption growth and the world component of consumption (output) growth, these economies are unable to accrue perfect risk-sharing but that risk-sharing has improved significantly. Pakko (1998) also compares the correlation between domestic consumption growth and output growth with the correlation between domestic consumption growth and world output growth, and reaches the same conclusion. Demyanyk et al. (2008) document significant improvements in risk-sharing across EU economies, and significant positive effects of intra EU capital flows on risk-sharing.

ing in emerging and developing economies during the financial integration process has been further investigated by using composition of financial assets and liabilities to study consumption risk sharing patterns. Of these various types of assets and liabilities, Kose and Prasad (2010) find that external debt is least conducive to risk-sharing, but the risk-sharing benefits of increased FDI and FPI holdings for emerging and developing economies also remain negligible.⁴

While the empirical findings on consumption risk-sharing, especially in emerging and developing economies, may be viewed as casting capital market integration in a negative light, Kose et al. (2007) instead suggest that they may indicate that the process of integration in these economies has not gone far enough to realize potential gains of consumption risk-sharing. This view is supported by findings in Kose et al. (2007), who use linear interaction terms and find that the benefits of financial integration in terms of international risk-sharing are accrued only after a certain thresholds of financial openness is reached. Similarly, Kose et al. (2011) identify threshold effects of financial depth and institutional quality for the effects of capital market integration on output growth rates using parametric and non-parametric approach and conclude that beyond the estimated threshold level, presumed risk of financial openness are also reduced and indirect benefits of consumption risk sharing could potentially be realized.

A synthesis of this empirical literature therefore already indicates the potential for threshold effects of capital market integration on welfare relevant measures such as output growth and international consumption risk-sharing. However, all of the existing literature uses exogenous specifications of threshold effects to in turn demonstrate the existence of threshold effects. A primary contribution of the present paper is to employ a methodology where threshold effects can be robustly identified without imposing prior assumption on the existence or levels of thresholds. Instead of using arbitrary threshold levels as a sample splitting criterion, I employ a systematic methodology developed by Hansen (1999) to simultaneously identify and estimate

⁴For a summary of predictions, methodologies and results on consumption risk-sharing in industrialized and emerging economies see, e.g., Kose and Prasad (2010) or Islamaj (2008).

threshold effects, levels, confidence intervals and coefficients directly from the data.

3 Data

I estimate threshold levels and coefficients of consumption risk-sharing from a balanced panel dataset of developing, emerging and advanced economies from 1985 – 2007. Per capita real GDP and per capita real (public plus private) consumption are taken from the World Bank’s Development Indicators. Stocks of financial assets and liabilities (debt, foreign direct investments (FDI), and foreign portfolio investment (FPI)) are taken from the extended “External Wealth of Nations” Dataset by Lane and Milesi-Ferretti (2007). Proxies of financial integration measure are constructed in line with the scale of international financial integration measures provided in Lane and Milesi-Ferretti (2007) which uses the actual cross-border capital stocks, and include the positive sum of items in the capital account (relative to GDP). These financial integration measures are in terms of total capital stock volume and equity volume (as percentage of GDP) (also referred as *de facto* measures).⁵

The data set has annual data over the period 1985–2007 for 21 developing, 22 emerging economies and 22 advanced economies. Sources of data and list of countries is provided in Table 11 and Table 10, respectively, in the Appendix. Table 12 gives summary statistics for the variables, including 10th, 25th, 50th (median), 75th and 90th percentiles for each type of capital stocks and per capital variables (average over all years) in the sample. The distinction between developing, emerging and advanced economies is based on IMF classifications in each time period. The list of countries matches closely the countries studied in other empirical work, such as Kose et al. (2009b). Minor omissions are due to the requirement of a balanced panel (so that lack of data availability or missing values result into exclusion of Cote d’Ivoire, Haiti, Iran, Panama, Papua New Guinea and Togo from the list of developing countries.).

⁵While the former measure includes debt securities which may be driven by other special factors, has less relevance for the risk sharing motivation, however the analysis in this paper employs both measures separately to study the potential threshold effects on consumption risk sharing.

4 Methodology

I first describe a specification for estimating international consumption risk-sharing based on Kalemli-Ozcan et al. (2003) and Demyanyk et al. (2008) in Section 4.1. In Section 4.2, I describe a methodology for identifying and estimating threshold effects from a balanced panel, which is introduced in Hansen (1999). Finally, Section 4.3 outlines a synthesis of these two methodologies that can be employed to identify and estimate threshold effects of financial integration on international consumption risk-sharing.

4.1 International Consumption risk-sharing

A common approach to measure consumption risk-sharing in the literature is to estimate a coefficient for a regression of country specific growth rates on country specific output (see, e.g., Kose et al., 2003, 2011; Bai and Zhang, 2012; Kalemli-Ozcan et al., 2003; Demyanyk et al., 2008) . Let i denote the country index and t the time index for a balanced panel of observations on I countries over T time periods. Per capita consumption (public and private) is denoted by c_{it} . To focus on country-specific growth rates and remove uninsurable aggregate shocks, denote aggregate consumption of the total sample in period t by $c_t := \sum_i c_{it}$. The country-specific consumption growth rate is then given by:

$$[\log(c_{it}) - \log(c_{i(t-1)})] - [\log(c_t) - \log(c_{t-1})] := \Delta \log(c_{it}) - \Delta \log(c_t) . \quad (1)$$

In a similar manner, country i 's year t , per capita GDP is denoted by y_{it} , and aggregate GDP of the total countries in the sample is denoted by $y_t := \sum_i y_{it}$ for all $t \in T$. The country specific GDP per capita growth rate is then captured by the following expression:

$$[\log(y_{it}) - \log(y_{i(t-1)})] - [\log(y_t) - \log(y_{t-1})] := \Delta \log(y_{it}) - \Delta \log(y_t) . \quad (2)$$

International consumption risk-sharing can be measured with the coefficient of a regression of country-specific consumption on country-specific GDP growth rates, in a basic regression controlling for country and time fixed effects.

$$\Delta \log(c_{it}) - \Delta \log(c_t) = \mu_i + \beta_c(\Delta \log(y_{it}) - \Delta \log(y_t)) + \epsilon_{it} , \quad (3)$$

where μ_i , is a country specific fixed effect and ϵ_{it} is an error term, assumed to be conditionally *i.i.d* normally distributed across $(i, t) \in I \times T$. Perfect consumption risk-sharing should imply zero correlation between the country-specific component of consumption growth rate and GDP growth rate, and can therefore be tested with the the null hypothesis that $\beta_c = 0$, while a complete absence of risk-sharing corresponds to the null $\beta_c = 1$. Coefficients between 0 and 1 correspond to partial risk-sharing, while coefficient greater than 1 indicate excess volatility.

Demyanyk et al. (2008) extend the benchmark specification outlined above to study whether consumption and income risk-sharing increase with greater financial integration. They estimate the effect that financial integration has on the consumption risk-sharing by including an interaction terms with foreign financial assets and liabilities relative to GDP (see, also, Melitz and Zumer, 1999). The empirical specification is therefore as follows:

$$\Delta \log(c_{it}) - \Delta \log(c_t) = \mu_i + \kappa(\Delta \log(y_{it}) - \Delta \log(y_t)) + \epsilon_{it} , \quad (4)$$

where they impose structure on the coefficient κ , allowing it to vary over time, countries and through the sum of foreign assets and liabilities (relative to GDP):

$$\kappa = \kappa_o + \kappa_1 t + \kappa_2 (F_{it} - F_i) . \quad (5)$$

In (5), F_{it} denotes the capital account entry for a generic class of foreign assets or liabilities in country $i \in I$ at time $t \in T$; and variables are included as deviations from country specific means $FA_i = \sum_T FA_{it}$. The structure includes a time trend in order to guard against any trend in assets and liabilities so that the analysis does not capture the changing trend of risk-sharing that may be the result of other

developments in national economies. The estimated value of $(1 - \kappa_o)$ then captures the average amount of consumption risk-sharing within the group of countries; κ_1 captures time trends; while κ_2 captures the effect of changes in foreign liability or asset position on consumption risk-sharing. $1 - \kappa_o - \kappa_1 t - \kappa_2(F_{it} - \bar{F}_i)$ measures the amount of consumption risk-sharing obtained in period t by country i .

Similar to the above methodology, the analysis in this paper is also based on fixed effects model and uses the specification (4) but with threshold effects of liability and asset positions in lieu of the linear-interaction specification of foreign asset effects in (4). At a basic level, this simply involves placing a different structure on the coefficient κ in (4). While mean, median or quantile values for thresholds may often be a convenient approximation, such threshold levels impose *ad hoc* restrictions on the data especially when the threshold variable is a decision variable for agents. I therefore follow an alternative method for identification of endogenous threshold effects based on the methodology introduced in Hansen (1999).

4.2 Threshold Effects in Non-Dynamic Panels

Hansen (1999) develops econometric techniques for estimating threshold effects in a balanced panel, where regression coefficients are not identical across all observations in the sample but differ depending on discrete classes they fall into. Thresholds are identified via an iterative bootstrap method, which also constructs consistent confidence intervals for the threshold parameters based on the asymptotic distribution of the error term. The statistical significance of threshold parameters is assessed on the basis of the bootstrap method. This method allows estimation of parameters from the sample which also has clear and tractable relevance for policy related issues. The basic regression equation of interest is of the following form:

$$y_{it} = \mu_i + \beta_1' x_{it} I(q_{it} \leq \gamma) + \beta_2' x_{it} I(q_{it} > \gamma) + \epsilon_{it} \quad (6)$$

where $I(\cdot)$ is the indicator function, the subscript $i \in I$ indexes the individual and the subscript $t \in T$ indexes time. In the first iteration, the observations are divided

into two regimes depending on the threshold variable, q_{it} . These regimes can be identified based on the regression slopes which are denoted by β_1 and β_2 . The basic identification assumption is that x_{it} and q_{it} are not time-invariant.⁶ The second iteration, tries to further divide the sample, continuing iterations until no further thresholds are identified. The method tests for the existence of threshold and further determines the number of thresholds which are estimated by least squares. The slope coefficients are estimated along with conventional OLS standard errors and white-corrected standard errors to test the significance of these slope coefficients.

In the above specification, the analysis tests for zero, one, two or three thresholds. The F -test statistics and the likelihood ratio along with bootstrap p values indicate significance of the threshold parameters. If the bootstrap p value is below the desired critical value, the null hypothesis of no threshold, one threshold, two threshold or three thresholds is rejected. Furthermore, the asymptotic confidence intervals for the threshold are then used to ascertain the certainty about the nature of the division based on the threshold parameters.

4.3 Consumption risk-sharing and Threshold Effects

In this section, I outline a synthesis of the consumption risk-sharing methodology described in Section 4.1 and threshold identification methodology described in Section 4.2, which represents the main empirical methodology that I employ to identify threshold effects on consumption risk-sharing. The threshold variables are de facto measure of financial integration, such as foreign asset and liability stocks (relative to

⁶For computational and econometric issues relating least square estimation and the non-standard asymptotic theory of inference refer to Hansen (1999).

GDP). The threshold regression specification follows:

$$\begin{aligned}
\Delta \log(c_{it}) - \Delta \log(c_t) = & \mu_i + \beta_o t (\Delta \log(y_{it}) - \Delta \log(y_t)) \\
& + \beta_c^1 (\Delta \log(y_{it}) - \Delta \log(y_t)) (F_{it} \leq \gamma_1) \\
& + \beta_c^2 (\Delta \log(y_{it}) - \Delta \log(y_t)) (\gamma_1 < F_{it} \leq \gamma_2) \\
& + \beta_c^3 (\Delta \log(y_{it}) - \Delta \log(y_t)) (\gamma_2 < F_{it} \leq \gamma_3) \\
& + \beta_c^4 (\Delta \log(y_{it}) - \Delta \log(y_t)) (\gamma_3 < F_{it}) + \epsilon_{it} \quad (7)
\end{aligned}$$

The basic specification simply places a different structure on κ in (4), based on threshold effects instead of linear interaction effects. The specification also captures time trends as suggested by Demyanyk et al. (2008) to control for changing trend of risk-sharing that may be result of any other developments in the national economies. The estimation of threshold effects and confidence regions is then based on Hansen’s (1999) iterative bootstrap procedure, which produces robust and consistent estimates of threshold values, confidence intervals and coefficients in each threshold regime. The statistic $(1 - \beta_c)$ is interpreted as the average amount of consumption risk-sharing within the regime, where respective β ’s differ on the basis of various regimes determined by the estimated threshold values of the financial integration measure.

5 Results

I use the basic specification (7), with threshold variables given by measures of financial integration. Specifically, I use (1) equity volume: total FDI and FPI positions (relative to GDP) and , (2) total volume: total positions (relative to GDP). A summary of results is presented in Table 1. Each column gives results for two different specification, which are discussed in detail below. A complete breakdown of the results of 4 iterations is then presented in Table 13 – 14 in the Appendix. The fourth iteration does not generate new thresholds in all cases, and so further iterations are not reported.

Table 1: Threshold Regression Results

	$\frac{FDI+FPI}{GDP}$	$\frac{Total}{GDP}$
Threshold 1	0.578	1.77
CI min	0.455	1.35
CI max	0.586	1.783
Threshold 2	0.922	3.257
CI min	0.922	3.00906
CI max	0.922	3.486
Threshold 3	X	X
CI min	X	X
CI max	X	X
F	19.445	30.532
Bootstrap P	0	0
β_o	0.00712***	0.00653***
OLS SE	0.00502	0.00490
HET SE	0.00865	0.00834
β_c^1	0.826****	0.795****
OLS SE	0.0334	0.0348
HET SE	0.0505	0.0519
β_c^2	1.305*	1.210*
OLS SE	0.106	0.0691
HET SE	0.239	0.134
β_c^3	0.465****	0.352***
OLS SE	0.117	0.112
HET SE	0.189	0.283
β_c^4	X	X
OLS SE	X	X
HET SE	X	X
Total Observations:	1472	1472
Number of years	23	23
number of countries	64	64

Note: The results (estimates of threshold levels and point estimates of (1) time trend (β_o) (2) coefficients of co movement between country-specific consumption and output growth rates ($\beta_c^1, \beta_c^2, \beta_c^3, \beta_c^4$)) provided in this table are based on panel regressions using specification 7 with (1) equity volume (normalized to GDP) and (2) total volume of capital holdings (normalized to GDP) as the threshold variable in column 1 and column 2, respectively. Corresponding to threshold level, confidence intervals (CI min and CI max) are also provided. OLS (OLS SE) and white, heteroskedastic corrected standard errors (HET SE) are provided beneath each estimate of the coefficients. Results significantly different from 1 are reported using following symbols: *** p<0.01, ** p<0.05, * p<0.1, * p<0.15. For details of regression specification, see Section 4.3.

5.1 Thresholds based on Total FDI and FPI

To read the results, start by looking at the estimation results for the full sample (first column of Table 1). Here, two significantly different threshold values of equity volume to GDP ratio are identified. More detailed results are provided in Table 13 in the Appendix:

Threshold 1 has a point estimate of $\approx 0.579 = 57.9\%$ and a 95% confidence interval of $\approx [0.455, 0.586]$.

Threshold 2 has a point estimate of $\approx 0.922 = 92.2\%$ and a 95% confidence interval of $\approx [0.922, 0.922]$.

The F -test for a single threshold and double threshold are highly significant with bootstrap P -value of 0.01 and 0.00, respectively. The complete result Table 13 in the Appendix also reports a third threshold value, “Threshold 3”, with a point estimate of $\approx 0.0796 = 7.96\%$ and a 95% confidence interval of $\approx (0.072126, 0.398924)$. However, the bootstrap P -value for the triple threshold regression is not significant at the 5% level, therefore indicated with X in the Table 1. Only up to three thresholds are reported in the Appendix because in both cases the third threshold is insignificant at the 5% level.

The confidence interval for Threshold 1 is relatively tight and does not overlap with the 95% confidence interval of Threshold 2, and so the estimation indicates the existence of 3 robust regimes, with different coefficients of risk-sharing:

Regime 1 lies below Threshold 1 and has an estimated risk-sharing coefficient $(1 - \beta_c^1) \approx 0.174\%$, which (with a White-error of ≈ 0.05) is statistically different from 1 but economically small, suggesting some limited risk-sharing.

Regime 2 lies between Thresholds 1 and 2 and has an estimated risk-sharing coefficient $(1 - \beta_c^2) \approx -0.305$. A significantly negative value of $(1 - \beta_c^2)$ rejects any consumption risk-sharing in this regime, and indicates the potential presence of

excess volatility at 15% significance level (country-specific consumption growth overreacts to changes in country-specific output growth).⁷

Regime 3 lies above Threshold 2 and has an estimated risk-sharing coefficient $(1 - \beta_c^3) \approx 0.534$, which is significantly greater than 0 and smaller than 1. Although perfect risk-sharing is rejected, country-time pairs in Regime 3 do exhibit significant risk-sharing, with an average correlation of country-specific consumption to output growth of approximately 53%.

Figure 1 provides a graphical representation of the findings. Using the estimates of equity volume to GDP as the threshold levels, the sample is split and the scatter plot along with ordinary least square fitted lines for each regime (Regime 1, Regime 2 and Regime 3) is plotted in the first three panels. Risk-sharing patterns from the estimates of β coefficients are also evident from the fourth panel of Figure 1 where the slope estimates are superimposed in a single illustration for the threshold variables. Figure 2 facilitates comparison of these estimated regime dependent coefficients of consumption risk sharing with reference line for no-risk sharing and full risk sharing.⁸

Finally, Table 2, Table 3 and Table 4 report the number of countries in each regime at each date, and Table 15, Table 16 and Table 17 in the Appendix report for each country in the sample, in which years it falls into each of the regimes identified for each specification. It is apparent that a significant number of emerging economies fall into Regime 2 for significant lengths of time, and that only a small number of emerging economies have successfully transitioned into Regime 3 (e.g., Chile, Israel, Jordan, Malaysia, Singapore and South Africa). Except for Singapore, the rest of emerging economies only transitioned into Regime 3 after 1999. However, advanced countries fall into Regime 3 overwhelmingly for nearly the whole of the sample period but especially in the recent years.

⁷At significance of 10% or below, β_c^2 is not significantly different from 1 indicating, that regime 2 has no evidence of consumption risk sharing.

⁸Confidence intervals at α significance level, for β coefficients can be found using $(\beta \pm t_\alpha * (HET))$ where t_α is the t statistics for α level of significance and HET is the heteroskedasticity adjusted white standard errors.

Table 2: Distribution of Developing Economies: FDI & FPI Threshold

Developing	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	Total
Regime 1	20	19	19	20	19	20	20	20	19	19	19	19	20	19	19	17	17	17	17	18	18	18	18	431
Regime 2	1	2	2	1	2	1	1	1	2	2	2	2	0	1	1	3	3	3	3	2	2	3	2	42
Regime 3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	10
Total	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	483

Note: This table shows distribution of developing countries in each year falling in each regime. Regimes are identified and estimated using Specification 7 with equity volume of capital holdings (normalized to GDP) as the threshold variable. The sample contains 21 developing countries. Last column provides total number of observations in the sample period (1985 – 2007), falling in each regime. For a more detailed country specific distribution see Table 15

Table 3: Distribution of Emerging Economies: FDI & FPI Threshold

Emerging	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	Total
Regime 1	21	21	21	21	21	21	21	21	20	20	20	20	19	19	18	18	17	16	15	16	16	15	11	428
Regime 2	1	0	0	0	0	0	0	1	1	1	1	2	2	0	1	3	3	5	3	2	1	5	32	
Regime 3	0	1	1	1	1	1	1	1	1	1	1	1	1	1	4	3	2	3	2	3	4	6	6	46
Total	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	506

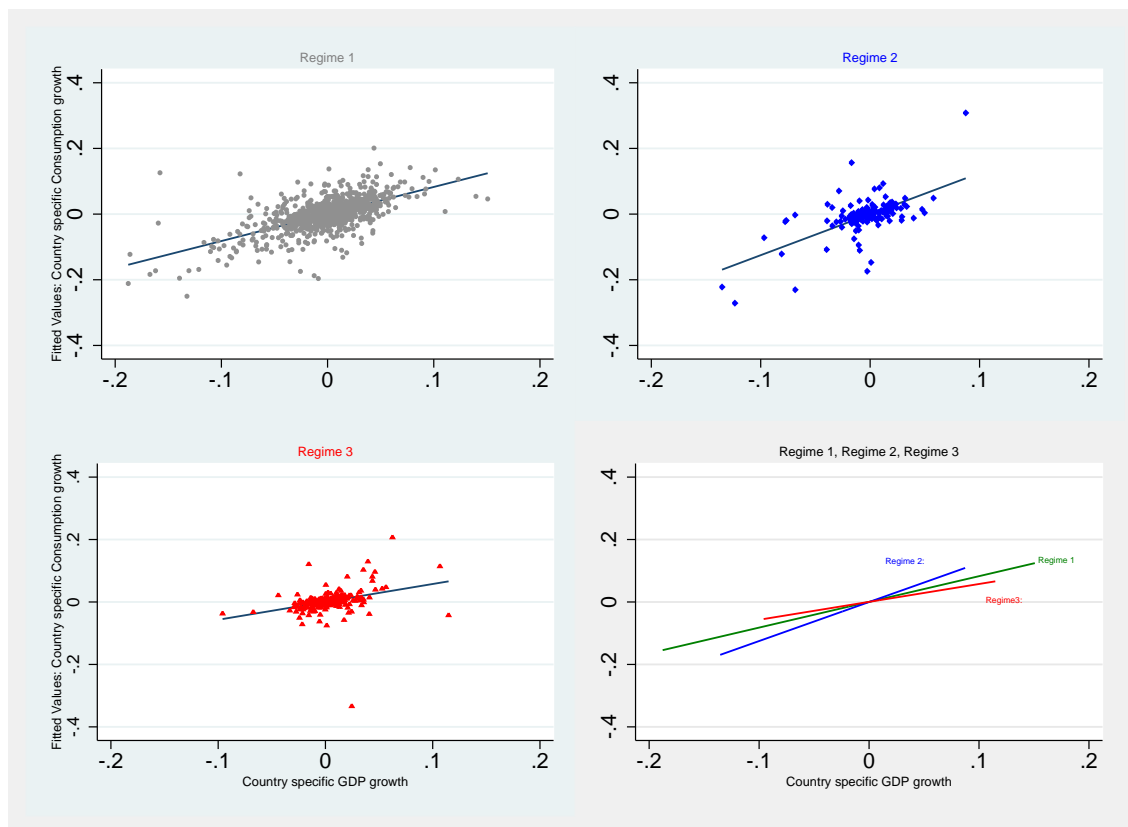
Note: This table shows distribution of emerging countries in each year falling in each regime. Regimes are identified and estimated using Specification 7 with equity volume of capital holdings (normalized to GDP) as the threshold variable. The sample contains 22 emerging countries. Last column provides total number of observations in the sample period (1985 – 2007), falling in each regime. For a more detailed country specific distribution see Table 16.

Table 4: Distribution of Advanced Economies: FDI & FPI Threshold

Advanced	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	Total
Regime 1	18	18	18	18	17	17	15	15	15	12	12	11	11	7	5	2	2	4	2	2	2	2	1	226
Regime 2	2	2	2	2	2	3	4	5	1	4	3	4	3	5	5	7	6	4	5	3	3	2	3	80
Regime 3	1	1	1	1	2	1	2	1	5	5	6	6	7	9	11	12	13	13	14	16	16	17	17	177
Total	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	483

Note: This table shows distribution of advanced countries in each year falling in each regime. Regimes are identified and estimated using Specification 7 with equity volume of capital holdings (normalized to GDP) as the threshold variable. The sample contains 22 advanced countries. Last column provides total number of observations in the sample period (1985 – 2007), falling in each regime. For a more detailed country specific distribution see Table 17.

Figure 1: FDI & FPI Holdings: Regimes

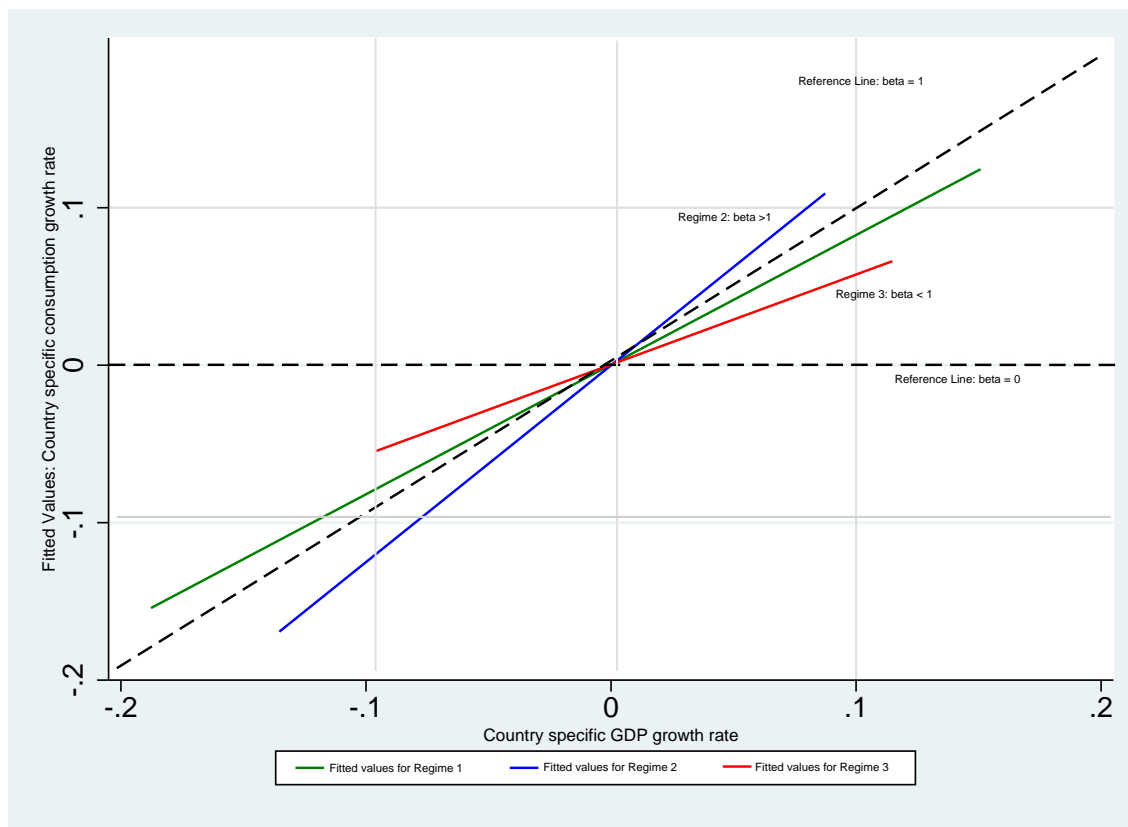


Note: Panel (1,1), Panel (1,2) and Panel (2,1) plot ordinary least square fitted lines for Regime 1, 2 and 3 respectively. These scatter plots are superimposed in Panel (2,2). Identification and estimation of regimes are based on equity volume (normalized to GDP) as a threshold variable.

5.2 Thresholds based on Total Foreign Assets and Liabilities

Analogous to Column 1 of Table 1, Column 2 reports estimation results for the full sample using total volume of holdings to GDP as the threshold variable. For this sample, the Threshold 1 point estimate is $\approx 1.77 = 177\%$ with a 95% confidence interval of $\approx [1.35, 1.78]$, and the Threshold 2 point estimate is $\approx 3.26 = 326\%$ with a 95% confidence interval of $\approx [3.01, 3.49]$. Since the two confidence intervals for estimates on the sample do not overlap, the F -test for the null hypothesis of

Figure 2: FDI & FPI Holdings: Regimes



Note: This figure reproduces Panel (2,2) of Figure 1 with additional reference lines. $\beta = 0$ ($\beta = 1$) is associated with full risk sharing (No risk sharing) and its corresponding reference line is the horizontal axis, $y = 0$ (45 degree line, $y = x$). Green line indicates regime 1, blue line indicates regime 2 and red line indicates regime 3's OLS fitted lines.

equality of coefficients (no threshold) is rejected, and the corresponding P value is 0.00, it is possible to identify again three robust regimes, with different coefficients of risk-sharing:

Regime 1 lies below Threshold 1 and has an estimated risk-sharing coefficient $(1 - \beta_1^c) \approx 0.21$, which (with a White-error of ≈ 0.034) is statistically and economically different from 0 and 1, suggesting almost 21% risk-sharing.

Regime 2 lies between Threshold 1 and Threshold 2 and has an estimated risk-sharing coefficient $(1 - \beta_2^c) \approx 0 = 0\%$, which is statistically different from 1 but not 0 (while β_2^c is significantly different from 0 but not 1), suggesting no significant risk-sharing (or perfect co-movement of domestic consumption growth rate and output growth rate).

Regime 3 lies above Threshold 2 and has an estimated risk-sharing coefficient $(1 - \beta_3^c) \approx 0.64$, which is significantly less than 1 (but greater than 0). In this regime, country-time pairs achieve an average of approximately 64% consumption risk-sharing.

Analogous to Figure 1, Figure 3 illustrates the scatter plot and OLS fitted line for the three sub-samples which use the split based on the estimates of threshold levels of total volume of capital holdings (normalized to GDP). Risk-sharing patterns from the estimates of β coefficients are presented in the fourth panel of Figure 3 and Figure 4, where the slope estimates are superimposed in a single illustration for the two threshold variables. The reference lines in Figure 4, facilitate comparison between $\beta = 1$ which captures no risk-sharing while $\beta = 0$ captures perfect risk-sharing. It is clear that Regime 1 and Regime 3 coefficients are between 0 and 1, while Regime 2's coefficient is ≈ 1 .

Table 5, Table 6 and Table 7 indicate the number of countries in each regime for each time period, and Table 18, Table 19 and Table 20 in the Appendix gives a more detailed distribution of country-time pairs in the three identified regimes. Qualitatively these results are very similar to the results achieved in the preceding section, Section 5.1. It is apparent that a significant number of emerging economies fall into Regime 2 in more recent years, while only a small number of emerging economies have transitioned into Regime 3 in the sample period (e.g., Chile, Israel, Jordan, Malaysia, Singapore and South Africa). Except for Singapore, the rest of emerging economies only transitioned into Regime 3 after 1999. Again, advanced countries overwhelmingly fall into Regime 3 over the full sample period.

Table 5: Distribution of Developing Economies: Total Threshold

Developing	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	Total
1	19	20	19	19	19	19	20	20	20	18	19	19	19	20	17	20	19	16	17	19	20	18	19	435
2	2	1	2	1	1	1	0	0	0	2	1	2	2	1	4	1	2	5	4	2	1	3	2	40
3	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	8
Total	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	483

Note: This table shows distribution of developing countries in each year falling in each regime. Regimes are identified and estimated using Specification 7 with total volume of capital holdings (normalized to GDP) as the threshold variable. The sample contains 21 developing countries. Last column provides total number of observations in the sample period (1985 – 2007), falling in each regime. For a more detailed country specific distribution see Table 19.

Table 6: Distribution of Emerging Economies: Total Threshold

Emerging	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	Total	
1	19	20	21	20	20	20	20	20	19	21	21	21	21	19	18	18	18	17	15	16	17	18	17	436	
2	3	1	0	1	1	1	1	1	2	0	0	0	0	2	3	3	3	4	6	5	4	3	4	48	
3	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	
Total	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	506

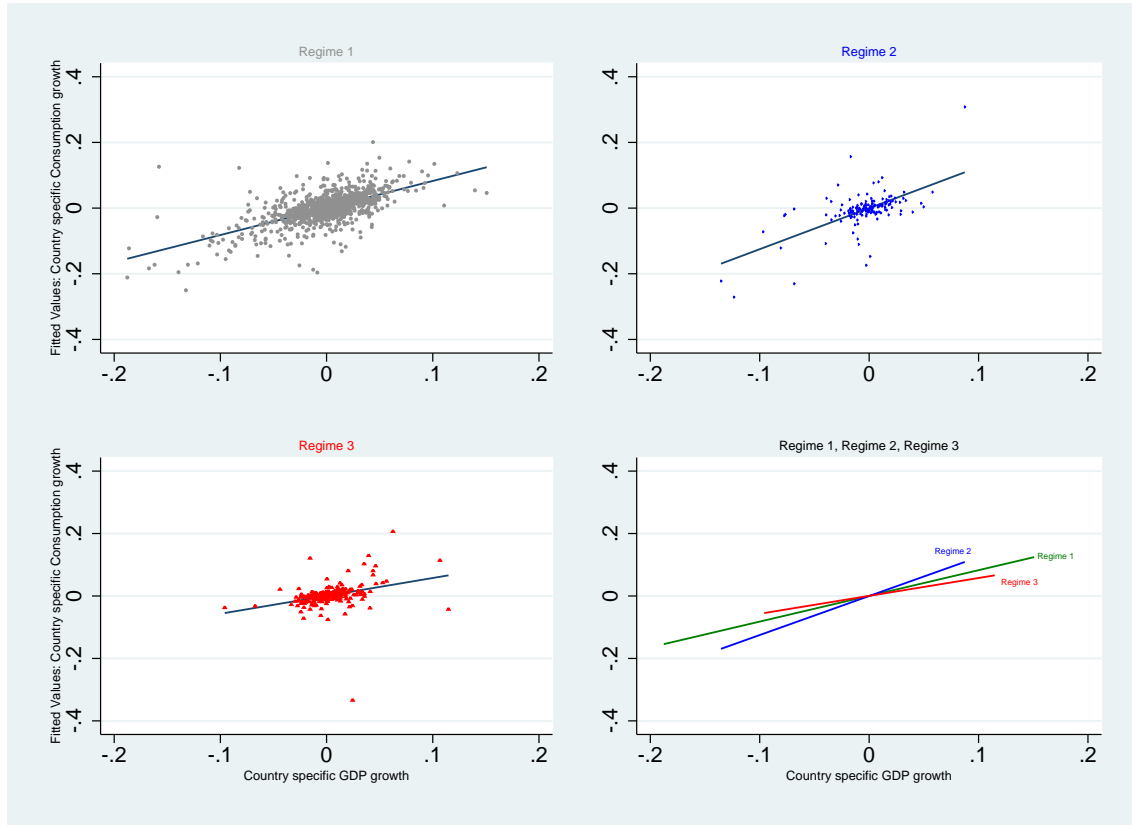
Note: This table shows distribution of emerging countries in each year falling in each regime. Regimes are identified and estimated using Specification 7 with total volume of capital holdings (normalized to GDP) as the threshold variable. The sample contains 22 emerging countries. Last column provides total number of observations in the sample period (1985 – 2007), falling in each regime. For a more detailed country specific distribution see Table 19.

Table 7: Distribution of Advanced Economies: Total Threshold

Advanced	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	Total
1	16	17	16	16	15	15	15	16	15	15	15	12	11	7	4	4	3	3	2	2	1	1	0	221
2	2	1	2	3	3	3	3	3	3	3	2	5	5	9	11	8	9	7	8	6	9	6	7	118
3	3	3	3	2	3	3	3	2	3	3	4	4	5	5	6	9	9	11	11	13	11	14	14	144
Total	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	483

Note: This table shows distribution of advanced countries in each year falling in each regime. Regimes are identified and estimated using Specification 7 with total volume of capital holdings (normalized to GDP) as the threshold variable. The sample contains 22 advanced countries. Last column provides total number of observations in the sample period (1985 – 2007), falling in each regime. For a more detailed country specific distribution see Table 20.

Figure 3: Total Holdings: Regimes

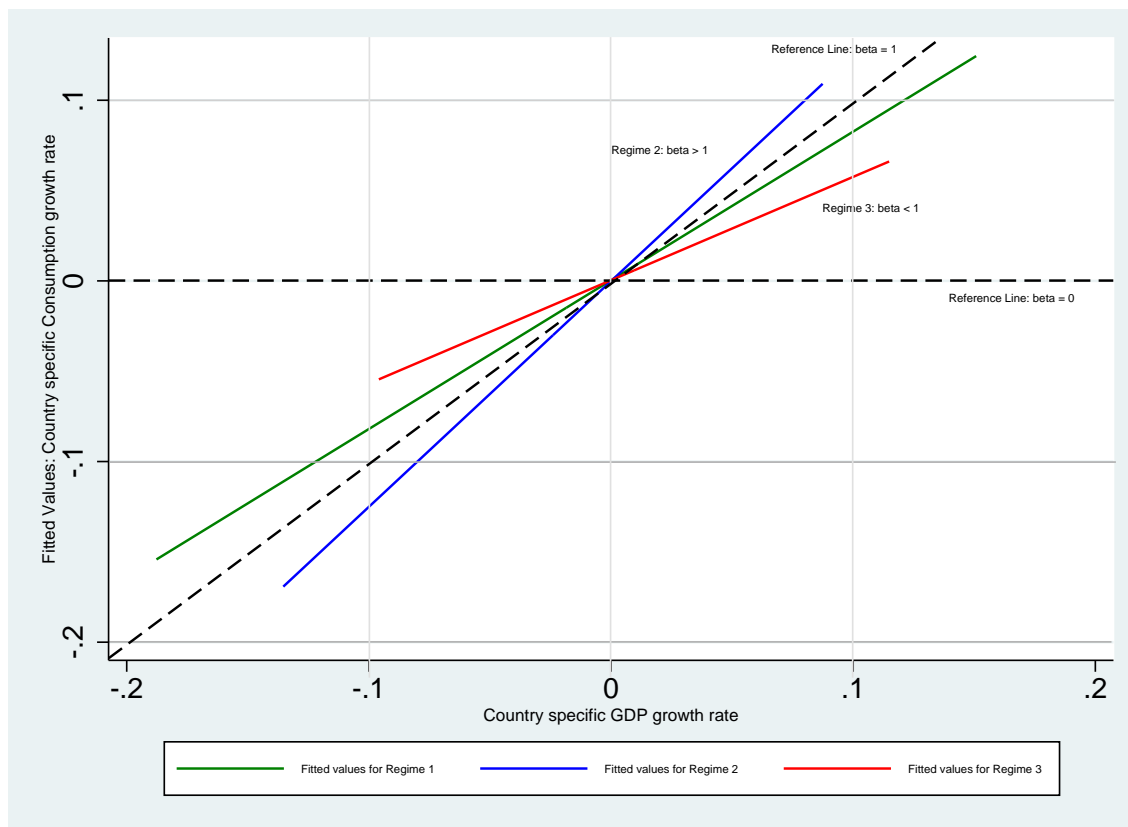


Note: Panel (1,1), Panel (1,2) and Panel (2,1) plot ordinary least square fitted lines for Regime 1, 2 and 3 respectively. These scatter plots are superimposed in Panel (2,2). Identification and estimation of regimes are based on total volume of capital holdings (normalized by GDP) as a threshold variable.

6 Discussion

To summarize the findings in Section 5, there is significant evidence of threshold effects of financial integration on cross-border consumption risk-sharing. Specifically, data suggest presence of two thresholds and three corresponding regimes, where risk-sharing patterns differ significantly. Regime 1 (characterized by low levels of financial integration) has statistically positive consumption risk-sharing, but the eco-

Figure 4: Total Holdings: Regimes



Note: This figure reproduces Panel (2,2) of Figure 1 with additional reference lines. $\beta = 0$ ($\beta = 1$) is associated with full risk sharing (No risk sharing) and its corresponding reference line is the horizontal axis, $y = 0$ (45 degree line, $y = x$). Green line indicates regime 1, blue line indicates regime 2 and red line indicates regime 3's OLS fitted lines.

economic significance is small, while Regime 3 (characterized by high levels of financial integration) has statistically and economically significant risk-sharing. However, at intermediate levels of financial integration, consumption risk-sharing is either insignificant or negative, suggesting a volatile intermediate phase in the process of financial integration. The basic qualitative findings are robust to alternative measures of financial integration. Moreover, Appendix B reports additional robustness checks, including the results of a specification that also includes additional interac-

tion term of country specific output growth rates and demeaned proxy of financial integration. When this interaction term is included the effect is small and insignificant, and the two thresholds remain significant with an intermediate regime that exhibits significantly no consumption risk-sharing.

To provide a context for the findings, in this Section I compare the results of the previous section to alternative specification which have been used in the existing literature (based on the dataset employed in Section 5). I first replicate specification 4, which has a linear interaction term alone, and then look at a specification similar to 7 but using the median levels of the financial integration measures to exogenously bifurcate the data into two subsamples (rather than estimating threshold levels directly from the data).

6.1 Linear Interactions

Table 6.1 reports the results based on linear interaction specification (Specification 4) for the full sample (64 economies from 1985–2007) and also separately for different country groups (developing, emerging, and advanced). Again, the current analysis uses two alternative *de facto* measures of financial integration (equity volume, and total volume of capital holdings, both normalized to GDP). The first and second column show the results for the full sample for each of the *de facto* measures for a fixed effects panel regression. The remaining columns reports results for each of the country groups in the following order: developing, emerging and advanced.

A negative coefficient κ_2 indicates that a greater degree of financial integration is associated with higher levels of consumption risk-sharing. However, it is clear that for the full sample, as well as emerging economies, none of the coefficients for the interaction term is statistically significant. In addition, $\kappa_2^{\frac{Total}{GDP}}$ is always positive, except for advanced economies, while $\kappa_2^{\frac{FDI+FPI}{GDP}}$ is always negative, except for developing economies. The results indicate that only advanced economies have achieved significant consumption risk-sharing, while developing economies exhibit excess volatility.

In particular, financial integration appears to have no significant effect on con-

Table 8: Threshold Regression Results: FDI & FPI and Total Holdings (normalized to GDP)

$C_i t$	Full: Total	Full: FDI & FPI	DEV: Total	DEV: FDI & FPI	EME: Total	EME: FDI & FPI	ADV: Total	ADV: FDI & FPI
κ_0	0.845*** (0.0541)	0.851*** (0.0552)	0.769*** (0.101)	0.779*** (0.101)	0.928*** (0.0545)	0.948*** (0.0617)	0.554*** (0.0465)	0.549*** (0.0472)
κ_1	0.00993 (0.0107)	0.0141 (0.0115)	0.0266 (0.0177)	-0.00855 (0.0230)	-0.00475 (0.0117)	0.000533 (0.0135)	-0.00402 (0.0102)	-0.00625 (0.0108)
$\frac{Total}{GDP}$								
κ_2	0.0394 (0.0442)		0.390*** (0.102)		0.0839 (0.101)		-0.0381** (0.0187)	
$\frac{FDLFI}{GDP}$								
κ_2		-0.0746 (0.0860)		2.671* (1.449)		-0.0492 (0.165)		-0.0795 (0.0599)
Observations	1,408	1,408	462	462	484	484	462	462
R-squared	0.360	0.360	0.248	0.249	0.550	0.548	0.318	0.315

Note: Regression results are based on Specification 4. Column 1, 3, 5 and 7 (2, 4, 6 and 8) use linear interaction term between total volume (equity volume) of capital holdings (normalized to GDP) and idiosyncratic output growth rates. Column 1 and 2 provides results for full sample while results for developing, emerging and advanced countries are provided in Column 3 and 4, 5 and 6, and 7 and 8, respectively. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

sumption risk-sharing. The division into developing, emerging and advanced economies is based on IMF classifications, which generally use income per capita as a criterion for division, and it therefore reflects an implicit prior assumption that consumption risk-sharing is related to per capita income. However, there is little theoretical justification for such an assumption, in contrast to the strong theoretical prediction that financial integration should promote risk-sharing. The threshold specification 7 therefore estimates the effect of financial integration on consumption risk-sharing more directly, by splitting the sample based on actual measures of financial integration, and then showing that there are threshold effects. The results in Section 5 also provide a more nuanced picture. Regime 2, where consumption risk-sharing is lowest, not only contains emerging economies, but also some developing economies and even some advanced economies. Moreover, the regime has a transitory nature with countries moving both in and out of this regime.

6.2 Median based thresholds

The previous literature has sometimes captured potential threshold effects by a simple median value bifurcation of the sample:

$$\begin{aligned}
\Delta \log(c_{it}) - \Delta \log(c_t) = & \mu_i + \beta_o t (\Delta \log(y_{it}) - \Delta \log(y_t)) \\
& + \beta_c^1 (\Delta \log(y_{it}) - \Delta \log(y_t)) (F_{it} \leq \gamma_{med}) \\
& + \beta_c^2 (\Delta \log(y_{it}) - \Delta \log(y_t)) (F_{it} > \gamma_{med}),
\end{aligned} \tag{8}$$

where γ_{med} is the median level of the financial integration measure in the data, and $1 - \beta_c^1$ (respectively, $1 - \beta_c^2$) is a measure of the average consumption risk-sharing for observations that lie below (respectively, above) the median level of financial integration.

Median value of equity volume, as well as total volume of holdings (to GDP), are used to split the sample and the corresponding results are presented in column 1 and

column 2 of Table 9. The results indicate that some improvement in risk-sharing is evident when financial integration exceeds the median level of equity volume to GDP (compare $\beta_c^1 = 0.888^{***}$ and $\beta_c^2 = 0.804^{***}$), while the opposite results are evident with total volume to GDP (compare $\beta_c^1 = 0.780^{***}$ and $\beta_c^2 = 0.902^{***}$). However, an F -test on the joint hypothesis can not reject that the hypothesis of no threshold effect.

Table 9: Threshold Regression Results: Total Holdings (normalized to GDP)

C_{it}	FDI & FPI	Total
β_o	0.0148 (0.00954)	0.0104 (0.0107)
β_c^1	0.888 ^{***} (0.0629)	
β_c^2	0.804 ^{***} (0.0851)	
β_c^1		0.780 ^{***} (0.0600)
β_c^2		0.902 ^{***} (0.0869)
Observations	1,408	1,408
R-squared	0.360	0.362

Note: Regression results, respectively in column 1 and 2 are based on Specification 6.2 for equity volume and total volume (both normalized to GDP) as the threshold variable. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The results reported in Table 9 indicate (1) a non-coherent picture from the two alternative measures of financial integration, and (2) the absence of threshold effects. Comparing the results in Table 9 with the results of Section 5 therefore indicates the danger of making policy conclusion through pre-imposed threshold levels. A close comparison of the results indicate that the first threshold estimate = 0.578 in Section 5 lies above $\gamma_{med} = 0.27$, so that Regime 2 is entirely absorbed by the subsample with lower and higher financial integration in the median threshold model. Country-

time pairs in regime 2 therefore “pull down” the estimated consumption risk-sharing for countries falling above and below median financial integration, masking the non-linear effect of financial integration on consumption risk-sharing. Therefore, the estimated coefficients of median threshold model are misleading as inputs into policy evaluation of the effects of financial integration on consumption risk-sharing.

7 Conclusion

This paper has outlined an empirical strategy for identifying threshold effects of financial integration on consumption risk-sharing, based on the threshold identification method in Hansen (1999). Applied to a panel data set of 64 developing, emerging and advanced economies from 1985 – 2007, I identify a robust qualitative feature of the data: Consumption risk-sharing is negligible at low levels of financial integration, and significant (though imperfect) at high levels of financial integration. However, intermediate to these estimated thresholds is a regime with significantly worse consumption risk-sharing (and some evidence of a regime with excess volatility). Conflicting evidence on the relationship between financial integration and consumption risk-sharing from the empirical literature can be understood better in the light of the findings reported in this paper. Specifically, ignoring the intermediate regime, or trying to impose a linear structure on the data generating process, is liable to lead to misleading conclusion about the potential benefits of financial integration for consumption risk-sharing. In fact, the results suggest that financial integration is associated with significant consumption risk-sharing, but only after a potentially destabilizing transitory phase.

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A Appendix: Data and Results

Table 10: List of Countries

Country	Type	Emerging	Advanced	Developing
1		Argentina	Australia	Algeria
2		Brazil	Austria	Bolivia
3		Chile	Belgium	Cameroon
4		China	Canada	Dominican R.
5		Colombia	Denmark	Ecuador
6		Costa Rica	Finland	El Salvador
7		Egypt	France	Ghana
8		India	Germany	Guatemala
9		Indonesia	Greece	Honduras
10		Israel	Ireland	Jamaica
11		Jordan	Italy	Mauritius
12		Korea	Japan	Nepal
13		Malaysia	Netherlands	Nicaragua
14		Mexico	New Zealand	Paraguay
15		Pakistan	Norway	Senegal
16		Peru	Portugal	Sri Lanka
17		Philippines	Spain	Trinidad and Tobago
18		Singapore	Sweden	Tunisia
19		South Africa	Switzerland	Uruguay
20		Thailand	United Kingdom	Zimbabwe
21		Turkey	United States	
22		Venezuela		

Note: The sample comprises 64 countries – 21 developing, 22 emerging economies and 22 advanced economies.

Table 11: Data Sources

Variable	Source
Stock of External Liabilities	EWN II
Stock of External Assets	EWN II
Stock of FDI liabilities	EWN II
Stock of Equity Liabilities	EWN II
Stock of External Debt Liabilities	World Bank
Stock of FDI Assets	EWN II
Stock of Equity Assets	EWN II
Stock of External Debt Assets	EWN II
GDP	WDI-WB
GDP per capita	WDI-WB
GNI per capita	WDI-WB
Consumption per capita	WDI-WB

Note: WDI-WB: World Development Indicators-World Bank, EWNII: Updated External Wealth of Nations. All data from EWN II and WDI is in constant (2005) price US dollar.

Table 12:

stats	GDP per Capita	Consumption per capita	Total Volume to GDP	Equity Volume to GDP
p10	615.29	485.15	0.62	0.08
p25	1284.82	1050.55	0.86	0.13
p50	3694.28	2856.42	1.22	0.27
p75	18136.74	13791.23	1.82	0.63
p90	25524.24	18664.22	3.56	1.18

Note: This table provide summary statistics in terms of percentiles. px correspond to xth percentile. 50th percentile (p50) corresponds to the median statistics.

Table 13: Threshold Regression Results: FDI & FPI Holdings (normalized to GDP)

FDI EQ	Single Threshold	Double Threshold	Double Threshold (Iteration II)	Triple Threshold
Threshold 1	0.922	0.578	0.578	0.0792
CI min	0.0721	0.455	0.455	0.0721
CI max	1.049	0.586	0.586	0.399
Threshold 2	X	0.922	0.922	0.578
CI min	X	0.922	0.922	0.455
CI max	X	0.922	0.922	0.586
Threshold 3	X	X	X	0.922
CI min	X	X	X	0.922
CI max	X	X	X	0.922
F	11.027	19.445	19.445	7.604
Bootstrap P	0.0133	0	0	0.06
β_o	0.0106	0.00712	0.00712	0.00282
OLS SE	0.00499	0.00502	0.00502	0.00526
HET SE	0.00969	0.00865	0.00865	0.00800
β_c^1	0.871***	0.826****	0.826****	0.660***
OLS SE	0.0320	0.0334	0.0334	0.0703
HET SE	0.0566	0.0505	0.0505	0.147
β_c^2	0.473****	1.305*	1.305*	0.864****
OLS SE	0.117	0.106	0.106	0.0362
HET SE	0.191	0.239	0.239	0.0480
β_c^3	X	0.465****	0.465****	1.313*
OLS SE	X	0.117	0.117	0.106
HET SE	X	0.189	0.189	0.241
β_c^4	X	X	X	0.472****
OLS SE	X	X	X	0.117
HET SE	X	X	X	0.186
Number of countries	64	64	64	64
Number of years	23	23	23	23
Total Observations	1472	1472	1472	1472

Note: This table provides additional details of the results provided in Table 1. The results (estimates of threshold levels and point estimates of (1) time trend (β_o) (2) coefficients of co movement between country-specific consumption and output growth rates ($\beta_c^1, \beta_c^2, \beta_c^3, \beta_c^4$) are based on panel regressions using specification 7 with equity volume of capital holdings (normalized to GDP) as the threshold variable. Corresponding to threshold level, confidence intervals (CI min and CI max) are also provided. OLS (OLS SE) and white, heteroskedastic corrected standard errors (HET SE) are provided beneath each estimate of the coefficients. For details of regression specification, see Section 4.3.

Table 14: Threshold Regression Results: Total Holdings (normalized to GDP)

Total	Single Threshold	Double Threshold	Double Threshold (Iteration II)	Triple Threshold
Threshold 1	3.257	1.771	1.771	1.391
CI min	3.009	1.348	1.348	0.616
CI max	3.486	1.783	1.783	1.441
Threshold 2	X	3.257	3.257	1.771
CI min	X	3.009	3.009	1.348
CI max	X	3.486	3.486	1.783
Threshold 3	X	X	X	3.257
CI min	X	X	X	3.009
CI max	X	X	X	3.486
F	23.025198	30.532	30.532	7.073
Bootstrap P	0	0	0	0.09
β_o	0.00823	0.00653	0.00653	0.00486
OLS SE	0.00494	0.00490	0.00490	0.00493
HET SE	0.00916	0.00834	0.00834	0.00836
β_c^1	0.878***	0.795****	0.795****	0.744****
OLS SE	0.0315	0.0348	0.0348	0.0398
HET SE	0.0533	0.0519	0.0519	0.0539
β_c^2	0.331***	1.210*	1.210*	0.957
OLS SE	0.113	0.0691	0.0691	0.0716
HET SE	0.280	0.134	0.134	0.122
β_c^3	X	0.352***	0.352***	1.213*
OLS SE	X	0.112	0.112	0.0689
HET SE	X	0.283	0.283	0.133
β_c^4	X	X	X	0.350***
OLS SE	X	X	X	0.112
HET SE	X	X	X	0.285
Number of countries	64	64	64	64
Number of years	23	23	23	23
Total Observations	1472	1472	1472	1472

Note: This table provides additional details of the results provided in Table 1. The results (which include the estimates of threshold levels and point estimates of (1) time trend (β_o) (2) coefficients of co movement between country-specific consumption and output growth rates ($\beta_c^1, \beta_c^2, \beta_c^3, \beta_c^4$)) are based on panel regressions using specification 7 with total volume of capital holdings (normalized to GDP) as the threshold variable. Corresponding to threshold level, confidence intervals (CI min and CI max) are also provided. OLS (OLS SE) and white, heteroskedastic corrected standard errors (HET SE) are provided beneath each estimate of the coefficients. Results significantly different from 1 are reported using following symbols: **** p<0.01, *** p<0.05, ** p<0.1, * p<0.15. For details of regression specification, see Section 4.3.

Table 15: Distribution of Developing Economies for FDI & FPI Holdings

	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Advanced	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Algeria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bolivia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1
Cameroon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Costa Rica	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dominican Republic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ecuador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
El Salvador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ghana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Guatemala	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Honduras	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mauritius	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nicaragua	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Papua New Guinea	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3
Paraguay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senegal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sri Lanka	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Syria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trinidad and Tobago	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2
Tunisia	2	2	2	1	2	1	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
Uruguay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Zimbabwe	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: This table provides distribution of country-time pairs (for a sample of 21 developing countries) in each of the three identified regimes. Identification and estimation of regimes is based on equity volume as the threshold variable. For details of identification and estimation of threshold levels and corresponding regimes, see Section 4 and Section 5.

Table 16: Distribution of Emerging Economies for FDI & FPI Holdings

Emerging	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Argentina	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
Brazil	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Chile	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3
China	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Colombia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Egypt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
India	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Indonesia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Israel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3
Jordan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3
Korea	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Malaysia	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	2	2	2	2	2	2	3	3
Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Morocco	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Pakistan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peru	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Philippines	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Singapore	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
South Africa	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	2	3	2	2	3	3
Thailand	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Venezuela	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1

Note: This table provides distribution of country-time pairs (for a sample of 22 emerging countries) in each of the three identified regimes. Identification and estimation of regimes is based on equity volume as the threshold variable. For details of identification and estimation of threshold levels and corresponding regimes, see Section 4 and Section 5.

Table 17: Distribution of Advanced Economies for FDI & FPI Holdings

Advanced	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Australia	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3
Austria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3
Belgium	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Canada	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
Denmark	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3
Finland	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	3	3	3
France	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3
Germany	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	2	3	3	3	3	3
Greece	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Ireland	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Italy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	2	2
Japan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Netherlands	2	2	2	2	3	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
New Zealand	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	2	2	2	2	2	3	2	2
Norway	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3
Portugal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3
Spain	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3
Sweden	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
Switzerland	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
United Kingdom	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
United States	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	2	2	3

Note: This table provides distribution of country-time pairs (for a sample of 22 advanced countries) in each of the three identified regimes. Identification and estimation of regimes is based on equity volume as the threshold variable. For details of identification and estimation of threshold levels and corresponding regimes, see Section 4 and Section 5.

Table 18: Distribution of Developing Economies for Total Holdings

Advanced	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Algeria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bolivia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
Cameroon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Costa Rica	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dominican Republic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ecuador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
El Salvador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ghana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
Guatemala	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Honduras	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
Mauritius	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nicaragua	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1
Papua New Guinea	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2
Paraguay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senegal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sri Lanka	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Syria	1	1	2	2	2	2	1	1	2	2	2	1	2	1	2	1	1	1	1	1	1	1	1
Trinidad and Tobago	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	2	1	1
Tunisia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uruguay	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Zimbabwe	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: This table provides distribution of country-time pairs (for a sample of 21 developing countries) in each of the three identified regimes. Identification and estimation of regimes is based on total volume of capital holdings as the threshold variable. For details of identification and estimation of threshold levels and corresponding regimes, see Section 4 and Section 5.

Table 19: Distribution of Emerging Economies for Total Holdings

Emerging	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Argentina	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1
Brazil	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chile	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2
China	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Colombia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Egypt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
India	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Indonesia	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
Israel	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Jordan	1	1	1	1	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Korea	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Malaysia	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Morocco	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pakistan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peru	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Philippines	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Singapore	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
South Africa	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thailand	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Venezuela	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1

Note: This table provides distribution of country-time pairs (for a sample of 22 emerging countries) in each of the three identified regimes. Identification and estimation of regimes is based on total volume of capital holdings as the threshold variable. For details of identification and estimation of threshold levels and corresponding regimes, see Section 4 and Section 5.

Table 20: Distribution of Advanced Economies for Total Holdings

Advanced	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
Australia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Austria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3
Belgium	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Canada	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Denmark	1	1	1	1	2	2	2	1	2	1	1	2	2	2	2	2	3	3	3	3	3	3	3
Finland	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3	3	3
France	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	3
Germany	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	2	3	3
Greece	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
Ireland	2	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
Italy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Japan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Netherlands	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
New Zealand	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Norway	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	2	3	3
Portugal	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3
Spain	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3
Sweden	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3
Switzerland	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
United Kingdom	3	3	3	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
United States	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2

Note: This table provides distribution of country-time pairs (for a sample of 22 advanced countries) in each of the three identified regimes. Identification and estimation of regimes is based on total volume of capital holdings as the threshold variable. For details of identification and estimation of threshold levels and corresponding regimes, see Section 4 and Section 5.

B Appendix: Robustness

Table 21 and Table 22 use the following specification:

$$\begin{aligned}
 \Delta \log(c_{it}) - \Delta \log(c_t) = & \mu_i + \beta_o t (\Delta \log(y_{it}) - \Delta \log(y_t)) \\
 & + \beta_f (\Delta \log(y_{it}) - \Delta \log(y_t)) (F_{it} - F_i) \\
 & + \beta_c^1 (\Delta \log(y_{it}) - \Delta \log(y_t)) (F_{it} \leq \gamma_1) \\
 & + \beta_c^2 (\Delta \log(y_{it}) - \Delta \log(y_t)) (\gamma_1 < F_{it} \leq \gamma_2) \\
 & + \beta_c^3 (\Delta \log(y_{it}) - \Delta \log(y_t)) (\gamma_2 < F_{it} \leq \gamma_3) \\
 & + \beta_c^4 (\Delta \log(y_{it}) - \Delta \log(y_t)) (\gamma_3 < F_{it}) + \epsilon_{it} \quad (9)
 \end{aligned}$$

where F_{it} is equity volume or total volume of capital holdings (normalized to GDP).

The tables below provide additional robustness check to the main results provided in Section 5. Specification 9 includes an additional interaction term for de-meanded capital holdings and country specific output growth rates. The main idea is to check if the threshold effects hold with this additional interaction term. It is possible

that the threshold estimation (that captures large effects of co-movement of country specific consumption and output growth rates) is driven by interaction terms (that captures small effects on co-movement of country specific consumption and output growth rates). Therefore, the above specification includes this interaction term as a control.

The results (which now include identification and estimation of threshold levels along with point estimates of (1) time trend (β_o) (2) interaction term (β_f) and (3) regime dependent coefficients of co movement between country-specific consumption and output growth rates (β_c^1 , β_c^2 , β_c^3 and β_c^4)) again show that two thresholds are evident with both proxies of financial integration measure i.e., (1) equity volume to GDP and (2) total volume of capital holdings to GDP as a threshold variable. Results corresponding to the former proxy, provided in Table 21, show that the main results in this paper are robust to this alteration while results for the later proxy provided in Table 22 reveal that quantitatively the first threshold is different but it still falls in the same confidence interval as the first threshold estimated under specification 7. Overall, the results are robust to this new specification.

Table 21: Threshold Regression Results: FDI & FPI Holdings (normalized to GDP)

FDI EQ	Single Threshold	Double Threshold	Double Threshold (Iteration II)	Triple Threshold
Threshold 1	0.922	0.578	0.578	0.0792
CI min	0.0721	0.455	0.455	0.0721
CI max	3.920	0.586	0.586	5.203
Threshold 2	X	0.922	0.922	0.578
CI min	X	0.922	0.922	0.455
CI max	X	0.922	0.922	0.586
Threshold 3	X	X	X	0.922
CI min	X	X	X	0.922
CI max	X	X	X	0.922
F	11.009	19.473	19.473	7.604
Bootstrap P	0.100	0.00667	0.00667	0.280
β_o	0.0104	0.00760	0.00760	0.00230
OLS SE	0.00575	0.00575	0.00575	0.00607
HET SE	0.0107	0.00976	0.00976	0.00922
β_f	0.00530	-0.0159	-0.0159	0.0159
OLS SE	0.0924	0.0920	0.0920	0.0925
HET SE	0.0893	0.0858	0.0858	0.0885
β_c^1	0.871***	0.826****	0.826****	0.659***
OLS SE	0.0320	0.0335	0.0335	0.0706
HET SE	0.0566	0.0506	0.0506	0.147
β_c^2	0.474****	1.306	1.306	0.865****
OLS SE	0.118	0.106	0.106	0.0364
HET SE	0.191	0.239	0.239	0.0480
β_c^3	X	0.465****	0.465****	1.313
OLS SE	X	0.117	0.117	0.106
HET SE	X	0.188	0.188	0.242
β_c^4	X	X	X	0.473****
OLS SE	X	X	X	0.117
HET SE	X	X	X	0.187
Number of countries	64	64	64	64
Number of years	23	23	23	23
Total Observations	1472	1472	1472	1472

Note: The results (estimates of threshold levels and point estimates of (1) time trend (β_o) (2) interaction term (β_f) and (3) coefficients of co movement between country-specific consumption and output growth rates (β_c^1 , β_c^2 , β_c^3 and β_c^4) are based on panel regressions using specification 9 where F_{it} is equity volume (normalized to GDP) as the threshold variable. Corresponding to threshold level, confidence intervals (CI min and CI max) are also provided. OLS (OLS SE) and white, heteroskedastic corrected standard errors (HET SE) are provided beneath each estimate of the coefficients. Results significantly different from 1 are reported using following symbols: **** p<0.01, *** p<0.05, ** p<0.1, * p<0.15.

Table 22: Threshold Regression Results: Total Holdings (normalized to GDP)

Total	Single Threshold	Double Threshold	Double Threshold (Iteration II)	Triple Threshold
Threshold 1	3.338	1.400	1.400	1.400
CI min	3.009	1.345	1.348	1.348
CI max	3.486	1.783	1.783	1.783
Threshold 2	X	3.338100	3.257031	1.770548
CI min	X	3.009	3.009	0.616
CI max	X	3.486	3.486	1.956
Threshold 3	X	X	X	3.257
CI min	X	X	X	3.009
CI max	X	X	X	3.486
F	22.049285	26.858	26.858	6.427
Bootstrap P	0	0	0	0.150
β_o	0.00565	0.00351	0.00329	0.00415
OLS SE	0.00515	0.00512	0.00512	0.00512
HET SE	0.00965	0.009244	0.009234	0.008901
β_f	0.0645	0.0391	0.0317	0.0193
OLS SE	0.0328	0.0329	0.0330	0.0333
HET SE	0.0480	0.0439	0.0437	0.0430
β_c^1	0.877***	0.747***	0.745***	0.745***
OLS SE	0.0316	0.0398	0.0398	0.0397
HET SE	0.0523	0.0539	0.0539	0.0536
β_c^2	0.322***	1.075	1.082	0.957
OLS SE	0.116	0.0511	0.0515	0.0722
HET SE	0.301	0.0913	0.0920	0.124
β_c^3	X	0.331***	0.345***	1.204*
OLS SE	X	0.115	0.112	0.0711
HET SE	X	0.283	0.289	0.134
β_c^4	X	X	X	0.352***
OLS SE	X	X	X	0.112
HET SE	X	X	X	0.288
Number of countries	64	64	64	64
Number of years	23	23	23	23
Total Observations	1472	1472	1472	1472

Note: The results (estimates of threshold levels and point estimates of (1) time trend (β_o) (2) interaction term (β_f) and (3) coefficients of co movement between country-specific consumption and output growth rates (β_c^1 , β_c^2 , β_c^3 and β_c^4)) are based on panel regressions using specification 9 where F_{it} is total volume of capital holdings (normalized to GDP) as the threshold variable. Corresponding to threshold level, confidence intervals (CI min and CI max) are also provided. OLS (OLS SE) and white, heteroskedastic corrected standard errors (HET SE) are provided beneath each estimate of the coefficients. Results significantly different from 1 are reported using following symbols: *** p<0.01, ** p<0.05, * p<0.1, . p<0.15.