

Notes on the Calculation of the Chinn-Ito Financial Openness Variable

Hiro Ito (ito@pdx.edu)

Menzie Chinn (mchinn@Lafollette.wisc.edu)

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kaopen_2005.xls, or **kaopen_2005.dta** in the STATA data format, is a data file that contains the updated version of the Chinn and Ito index (2006) series. *KAOPEN* is an index to measure a country's degree of capital account openness. The dataset encompasses the time period of **1970-2005** for **181 countries**. From this year on, former communist states are also included in the data set. A complete list of the countries and their data availability are presented in the Country List.

Construction of *KAOPEN*

KAOPEN is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)*. Up to 1996, the dummy variables reflected the four major categories on the restrictions on external accounts. These variables are:

- k_1 : variable indicating the presence of multiple exchange rates;
- k_2 : variable indicating restrictions on current account transactions;
- k_3 : variable indicating restrictions on capital account transactions; and
- k_4 : variable indicating the requirement of the surrender of export proceeds.

In 1996, the classification method in the *AREAER* changed and these four categories became more disaggregated as an effort to reflect the complexity of capital controls policies.¹ For the extension of the four binary classifications after 1996, we followed Mody and Murshid (2005).

¹ Especially, the k_3 category was divided into 13 categories. See Johnston and Tamirisa (1998) and Miniane (2004) for details.

In order to focus on the effect of *financial openness* – rather than *controls* – we reverse the values of these binary variables, such that the variables are equal to one when the capital account restrictions are non-existent. Moreover, for controls on capital transitions (k_3), we use the share of a five-year window (encompassing year t and the preceding four years) that capital controls were not in effect ($SHAREk_3$).

$$SHAREk_{3,t} = \left(\frac{k_{3,t} + k_{3,t-1} + k_{3,t-2} + k_{3,t-3} + k_{3,t-4}}{5} \right)$$

Then we construct an index for capital “openness” ($KAOPEN_t$), which is the first standardized principal component of $k_{1,t}$, $k_{2,t}$, $SHAREk_3$, $k_{4,t}$. This index takes on higher values the more open the country is to cross-border capital transactions. By construction, the series has a mean of zero. The first eigenvector for $KAOPEN$ was found to be $(SHAREk_3, k_1, k_2, k_4)' = (0.57, 0.25, 0.52, 0.58)'$, indicating that the variability of $KAOPEN$ is not merely driven by the $SHAREk_3$ series.

We incorporate the $k_{1,t}$, $k_{2,t}$, and $k_{4,t}$ variables in our $KAOPEN$ variable instead of focusing on k_3 which refers to restrictions on capital account transactions. We believe the incorporation of $k_{1,t}$, $k_{2,t}$, and $k_{4,t}$ in this index allows us to more accurately capture the intensity of the capital controls.² This point can be made more concrete by considering a country with an open capital account. It may still restrict the flow of capital by limiting transactions on the current account restrictions or other systems such as multiple exchange rates and requirements to surrender export proceeds. Alternatively, countries that already have closed capital accounts might try to increase the stringency of those controls by

² Quinn (1997) imputes the level of intensity by making qualitative judgments based on *AREAER*. The Quinn index is a composite measure of financial regulation that ranges from 0 to 14, with 14 representing the least regulated and most open regime. The bulk of the index is based upon Quinn’s coding of the qualitative information contained in the *AREAER* pertaining to k_2 and k_3 , augmented by information regarding whether the country in question has entered into international agreements with international organizations such as the OECD and EU. A complete tabulation for the OECD members exists, but the coverage for the less developed countries is much less extensive. Johnston and Tamirisa (1998) created the time series of capital controls based on the new disaggregated components in the *AREAER*. However, their data series are not sufficiently long; it only covers years after 1996. Most recently, Miniane (2004) constructed a set of indices to measure the intensity of capital controls, based on an approach akin to Johnston et al., but extending the data back to 1983 for 34 countries.

imposing k_1 , k_2 , and k_4 types of restrictions so that the private sector cannot circumvent the capital account restrictions.

By the nature of its construction, this index is considered to be *de jure* measures on financial openness because it attempts to measure regulatory restrictions on capital account transactions. Hence, this index is different from price-based measures on financial openness, namely those based on the interest rate parity (UIP or RIP) approach such as Cheung, et al. (2003) or those on deviations from no arbitrage profits conditions such as De Gregorio (1998). Researchers often refer to these price-based measures as *de facto* measures on financial integration. These two types of financial openness measures have their own strengths and weaknesses.³ However, it is almost impossible not only to rank the supremacy of these measures, but also to distinguish them. Nonetheless, this index focuses on regulatory aspects of capital account openness.

Clearly, the measurement of the extent of capital account controls is a difficult enterprise. Many researchers have tried to capture the complexity of real-world capital controls, with varying degrees of success, and varying degrees of coverage.⁴ For reviews and comparisons of various measures on capital controls, refer to Edwards (2001), Edison *et al.* (2002) and Eichengreen (2002).

³ One of the drawbacks of *de jure* measures on financial openness is that as Edwards (1999) discusses, it is often the case that the private sector circumvents capital account restrictions, nullifying the expected effect of regulatory capital controls, which can be captured by price-based measures. A drawback of the price-based measures, on the other hand, is the measures, especially those based on the interest rate parity conditions, can reflect changes in macroeconomic conditions even if there is no regulatory changes on capital account transactions. For categorization of measures on financial integration and/or financial openness, refer to Cavoli, et al. (2003) and Takagi and Hirose (2004).

⁴ Some indices are sector-specific. Edison and Warnock (2001) present an index of equity market openness. Kaminsky and Schmukler (2001) calculate indices for domestic financial system, equity market, and capital account liberalization, for a select number of developed and emerging market countries.

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65	436	ISR	Israel	(1970 - 2005)	99	622	CMR	Cameroon	(1970 - 2005)
66	439	JOR	Jordan	(1970 - 2005)	100	624	CPV	Cape Verde	(1982 - 2005)
67	443	KWT	Kuwait	(1970 - 2005)	101	626	CAF	Central African Repub.	(1970 - 2005)
68	446	LBN	Lebanon	(1970 - 2005)	102	628	TCO	Chad	(1970 - 2005)
69	449	OMN	Oman	(1977 - 2005)	103	632	COM	Comoros	(1981 - 2005)
70	453	QAT	Qatar	(1976 - 2005)	104	634	COG	Congo, Rep.	(1970 - 2005)
71	456	SAU	Saudi Arabia	(1970 - 2005)	105	636	ZAR	Congo, Dem. Rep.	(1970 - 2000)
72	463	SYR	Syrian Arab Republic	(1970 - 2005)	106	638	BEN	Benin	(1970 - 2005)
73	466	ARE	United Arab Emirates	(1976 - 2005)	107	642	GNQ	Equatorial Guinea	(1973 - 2005)
74	469	EGY	Egypt, Arab Rep.	(1970 - 2005)	108	643	ERI	Eritrea	(1998 - 2005)
75	512	AFG	Afghanistan	(1970 - 2004)	109	644	ETH	Ethiopia	(1970 - 2005)
76	513	BGD	Bangladesh	(1976 - 2005)	110	646	GAB	Gabon	(1970 - 2005)
77	514	BTN	Bhutan	(1985 - 2005)	111	648	GMB	Gambia, The	(1971 - 2005)
78	518	MMR	Myanmar	(1970 - 2005)	112	652	GHA	Ghana	(1970 - 2005)
79	522	KHM	Cambodia	(1973 - 2005)	113	654	GNB	Guinea - Bissau	(1981 - 2005)
80	524	LKA	Sri Lanka	(1970 - 2005)	114	656	GIN	Guinea	(1970 - 2005)
81	532	HKG	Hong Kong, China	(1970 - 2005)	115	662	CIV	Cote d'Ivoire	(1970 - 2005)
82	534	IND	India	(1970 - 2005)	116	664	KEN	Kenya	(1970 - 2005)
83	536	IDN	Indonesia	(1970 - 2005)	117	666	LSO	Lesotho	(1972 - 2005)
84	542	KOR	Korea, Rep.	(1970 - 2005)	118	668	LBR	Liberia	(1970 - 2005)
85	544	LAO	Lao PDR	(1970 - 2005)	119	672	LBY	Libya	(1970 - 2005)
86	548	MYS	Malaysia	(1970 - 2005)	120	674	MDG	Madagascar	(1970 - 2005)
87	556	MDV	Maldives	(1982 - 2005)	121	676	MWI	Malawi	(1970 - 2005)
88	558	NPL	Nepal	(1970 - 2005)	122	678	MLI	Mali	(1970 - 2005)
89	564	PAK	Pakistan	(1970 - 2005)	123	682	MRT	Mauritania	(1970 - 2005)
90	566	PHL	Philippines	(1970 - 2005)	124	684	MUS	Mauritius	(1972 - 2005)
91	576	SGP	Singapore	(1970 - 2005)	125	686	MAR	Morocco	(1970 - 2005)
92	578	THA	Thailand	(1970 - 2005)	126	688	MOZ	Mozambique	(1988 - 2005)
93	582	VNM	Vietnam	(1970 - 2005)	127	692	NER	Niger	(1970 - 2005)
94	611	DJI	Djibouti	(1982 - 2005)	128	694	NGA	Nigeria	(1970 - 2005)
95	612	DZA	Algeria	(1970 - 2005)	129	698	ZWE	Zimbabwe	(1984 - 2005)
96	614	AGO	Angola	(1993 - 2005)	130	714	RWA	Rwanda	(1970 - 2005)
97	616	BWA	Botswana	(1972 - 2005)	131	716	STP	Sao Tome and Principe	(1981 - 2004)
98	618	BDI	Burundi	(1970 - 2005)	132	718	SYC	Seychelles	(1981 - 2005)

133	722	SEN	Senegal	(1970 - 2005)	167	926	UKR	Ukraine	(1998 - 2005)
134	724	SLE	Sierra Leone	(1970 - 2005)	168	927	UZB	Uzbekistan	(1998 - 2005)
135	726	SOM	Somalia	(1970 - 2005)	169	935	CZE	Czech Republic	(1998 - 2005)
136	728	NAM	Namibia	(1994 - 2005)	170	936	SVK	Slovak Republic	(1998 - 2005)
137	732	SDN	Sudan	(1970 - 2005)	171	939	EST	Estonia	(1998 - 2005)
138	734	SWZ	Swaziland	(1973 - 2005)	172	941	LVA	Latvia	(1998 - 2005)
139	738	TZA	Tanzania	(1970 - 2005)	173	944	HUN	Hungary	(1998 - 2005)
140	742	TGO	Togo	(1970 - 2005)	174	946	LTU	Lithuania	(1998 - 2005)
141	744	TUN	Tunisia	(1970 - 2005)	175	948	MNG	Mongolia	(1998 - 2005)
142	746	UGA	Uganda	(1970 - 2005)	176	960	HRV	Croatia	(1998 - 2005)
143	748	BFA	Burkina Faso	(1970 - 2005)	177	961	SVN	Slovenia	(1998 - 2005)
144	754	ZMB	Zambia	(1970 - 2005)	178	962	MKD	Macedonia, FYR	(1998 - 2005)
145	813	SLB	Solomon Islands	(1982 - 2005)	179	963	BIH	Bosnia and Herzeg.	(1999 - 2005)
146	819	FJI	Fiji	(1975 - 2005)	180	964	POL	Poland	(1990 - 2005)
147	826	KIR	Kiribati	(1990 - 2005)	181	968	ROM	Romania	(1976 - 2005)
148	846	VUT	Vanuatu	(1985 - 2000)					
149	853	PNG	Papua New Guinea	(1979 - 2005)					
150	862	WSM	Samoa	(1975 - 2005)					
151	866	TON	Tonga	(1989 - 2005)					
152	867	MHL	Marshall Islands	(1996 - 2005)					
153	868	FSM	Micronesia, Fed. Sts.	(1996 - 2005)					
154	911	ARM	Armenia	(1996 - 2005)					
155	912	AZE	Azerbaijan	(2000 - 2005)					
156	913	BLR	Belarus	(1996 - 2005)					
157	914	ALB	Albania	(1996 - 2005)					
158	915	GEO	Georgia	(1998 - 2005)					
159	916	KAZ	Kazakhstan	(1998 - 2005)					
160	917	KGZ	Kyrgyz Republic	(1998 - 2005)					
161	918	BGR	Bulgaria	(1996 - 2005)					
162	921	MDA	Moldova	(1998 - 2005)					
163	922	RUS	Russian Federation	(1998 - 2005)					
164	923	TJK	Tajikistan	(1998 - 2005)					
165	924	CHN	China	(1970 - 2005)					
166	925	TKM	Turkmenistan	(1998 - 2005)					