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Institutional Arrangements and International Trade: Evidence from Hong Kong*

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Abstract
Over the past few decades, Hong Kong has experienced various changes in its external political and monetary arrangements. In 1997, Hong Kong became a special administered region of China, after having been a British crown colony for more than 150 years. The currency board mechanism, initially based on the pound sterling, was abandoned in 1972, but eventually restored in 1983, this time based on the US dollar.
In this paper, I examine the impact of these political and monetary arrangements on Hong Kong's pattern of international trade. I find no evidence that changes in institutional linkages had a significant effect on bilateral trade relationships. In contrast to previous studies, the evidence is based on both types of regime switches, exits and entries. Also, dissolved arrangements ended without any major turbulences or disruptions.

JEL Code: F14; F15; F33

Keywords: monetary integration; currency board; colony; political link

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I. Introduction

Recent research suggests that political and monetary arrangements have a sizable impact on international patterns of trade. John McCallum (1995), for instance, finds that institutions that are typically associated with a functioning nation state are strongly beneficial for trade; he estimates that Canadian provinces trade about twenty-two times more with each other than with an otherwise identical US state. Andrew Rose (2000) explores the effect of sharing a common currency on trade and finds that trade within a currency union is about three times larger than trade between countries with different currencies, holding other things constant.

While the direction of these effects is generally intuitive (with lower transaction costs implying higher amounts of trade), the magnitude of the estimated coefficients appears to be implausibly large.[1] As a result, a large and still rapidly growing literature performs extensive robustness checks, essentially aiming to downsize these estimates. A major source of concern, for instance, are potential econometric issues in the estimation such as endogeneity or omitted variables bias. Strong bilateral trade links could have affected a country's currency choice; unobserved third factors could have influenced both currency choice and trade links. In both cases cross-section OLS estimation would yield upwardly biased parameter estimates of the effect of institutional arrangements on trade. As a (widely preferred) solution, panel fixed effects estimation is applied where country-pair specific fixed effects capture any systematic differences in bilateral trade intensity.[2]

[1] John Helliwell (1996) reports results of a survey among a group of faculty and graduating students in economics and political science on the trade intensity between Canada and the US. The median respondent estimates intra-Canadian trade intensity to be on the order of 0.8 (instead of McCallum's empirical result of factor 22); that is, trade linkages among Canadian provinces are expected to be even *weaker* than provincial trade with US states. Of the 71 responses, two-thirds of the answers fell in the range between 0.7 and 1.1.

[2] One of the reasons why the strategy of simply replacing estimation techniques has become so popular is that the original results were derived from fairly unique data sets. McCallum (1995) examined data on trade flows within a country, data that seems to be unavailable for

An alternative approach to deal with these issues is to identify episodes of changes in a country's external institutional arrangements and then to analyze the effects of these changes on trade directly. Rodney Thom and Brendan Walsh (2002) provide such an uni-observational case study, focusing on Ireland's break of the pound sterling link in 1979.[3] In this paper, I explore another useful "natural experiment" based on the experiences of Hong Kong. In particular, it is argued that Hong Kong provides an almost unique background to analyze the economic effects of external institutional arrangements. Hong Kong has not only experienced multiple changes in its external linkages in recent history. These changes also affected different types of institutional regimes, covering both political and monetary arrangements. Moreover, linkages were dissolved as well as newly entered, thereby avoiding a one-sided perspective. Finally, dissolved arrangements typically ended without major political unrest, allowing to isolate the effects of the regime change from other external influences affecting the bilateral trade relationship.

To preview the main results, I find no evidence that changes in institutional arrangements had a measurable effect on Hong Kong's pattern of trade. While the intensity of trade with anchor countries varies considerably over time, these changes are basically unrelated to changes in bilateral institutional linkages. This result adds to the (negative) case study evidence in Thom and Walsh (2002) for Ireland.

The remainder of the paper is organized as follows. Section 2 briefly describes the historical background. Section 3 examines the evolution of Hong Kong's bilateral trade relationships with anchor countries over time, followed by a panel analysis of Hong Kong's external trade with more than 170 international trading partners for the period from 1960 to 2002. Section 5 provides a brief conclusion.

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many other countries. Rose (2000) constructed a data set that included many tiny territories (often islands) without a national currency.

[3] Nitsch (2006) analyzes the effects of the formation of the economic union between Belgium and Luxembourg in 1921.

II. Background

Over the past few decades, Hong Kong has experienced various changes in its external political and monetary arrangements. For most countries or territories in the world, the (peaceful) dissolution of a major external institutional linkage or the entry into a new arrangement is a rare event. Hong Kong, in contrast, has repeatedly experienced both types of changes in recent years (sometimes even at the same time) so that Hong Kong has effectively switched anchor countries.

Concerning Hong Kong's political status, the (latest) major change was the handover of Hong Kong from the UK to China on 1 July 1997. Hong Kong was occupied by the British during the first opium war (1839-42) and became a British crown colony in 1843. Further territories were then added to the possession in 1860 after the second opium war, while even more adjacent lands were leased by Britain for a period of 99 years in 1898. With a four year interruption of Japanese occupation during World War II (1941-45), British colonial rule of Hong Kong lasted for more than one and a half centuries. In the early 1980s, with the British lease contract running out, the United Kingdom and China started negotiations about the future of Hong Kong. On 19 December 1984, both countries agreed that sovereignty will be handed over back to China, with China guaranteeing that Hong Kong will enjoy a high degree of autonomy for the next 50 years. On 1 July 1997, British rule over Hong Kong ended and the crown colony became a Special Administrative Region (SAR) of China.

Hong Kong's monetary policy linkage to the United Kingdom had been already dissolved a few years earlier, in 1972.[4] As many other British colonies, Hong Kong had practised a fixed rate arrangement to the pound sterling. However, exchange rate relations to other currencies were always of large importance for Hong Kong. The sterling-based currency

[4] For a more detailed description of Hong Kong's monetary history, see the excellent discussion in Tony Latter (2004).

board was established only relatively late, in 1935, when China left the silver standard and Hong Kong, which had been operating the same monetary standard, was effectively forced also to suspend silver convertibility. When the sterling devalued in 1967, the currency board parity of the Hong Kong dollar to the sterling was quickly adjusted, thereby dampening the devaluation of the Hong Kong dollar against other currencies. It is against this background that Hong Kong authorities immediately broke with the sterling when the Bretton Woods system collapsed and the sterling started to float in July 1972. After a brief period of pegging to the US dollar, the Hong Kong dollar was allowed to float in November 1974.[5]

The currency board was then hastily restored in October 1983, this time based on the US dollar. The course of negotiations between Britain and China had led to growing uncertainty about the future of Hong Kong and the value of the Hong Kong dollar was falling rapidly. To restore confidence, a return to a formal currency board mechanism was widely considered the best available option. Hong Kong had no central bank and lacked many necessary financial instruments to stabilize the currency. Also, a currency board scheme had been successfully operated in the past and could easily be implemented without major institutional reform. On 15 October 1983, the Hong Kong dollar was tightly linked to the US dollar at a rate of 7.80.[6]

Given these three episodes of major regime changes – the give-up of the UK pound sterling peg in 1972, the establishment of a currency board linkage with the US dollar in 1983, and the reversion to Chinese administration in 1997 – Hong Kong's modern history provides an interesting case study to examine the effects of formal external arrangements.

[5] Latter (2004, fn. 87) convincingly argues that while it is true that the nominal rate was being held against the US dollar until November 1974, "the crucial change in the operational monetary framework had already been effected in July 1972."

[6] On the choice of the anchor currency, Latter (2004, p. 31) notes that "[t]here was unanimity among officials and others consulted that the reference currency should be the US dollar. The idea of a basket of more than one currency was raised but quickly dismissed. Despite the advantages which this might have brought in terms of minimizing fluctuations against trading partners on average, officials decided that Hong Kong needed a simple and transparent system."

Hong Kong currently has (or previously had) tight institutional links of various types to three different countries; these links were either entered or dissolved in recent years, allowing to explore the time dynamics of the effects.

III. Time series evidence

In order to identify the effect of changes in institutional arrangements on Hong Kong's pattern of trade, I perform a step-wise analysis. I begin with a simple graphical analysis of Hong Kong's bilateral trade relationships with its three anchor countries. Figure 1 portrays the evolution of real trade values over time, with vertical lines marking the change in an institutional arrangement (solid lines mark exits; dotted lines mark entries). Visual inspection does not provide support for the hypothesis that institutional arrangements affect trade. Hong Kong's trade with the United Kingdom has continued to increase (at apparently unchanged pace) after the departure from the pound sterling link. While trade levels have slightly declined at the end of the sample period (i.e., after the dissolution of the political link with the United Kingdom), this drop appears to be mainly related to other factors such as the Asian crisis, since also trade with the US has fallen at that time. Adding to this picture, the formation of new arrangements had also no clearly identifiable effect on Hong Kong's pattern of trade. Trade with the United States has not visibly benefited from the establishment of a currency board linkage with the US dollar. Hong Kong's trade with China has strongly increased *before* the territory's changeover, but slowed since.

In figure 2, I graph the evolution of bilateral trade shares; that is, Hong Kong's trade with other countries is additionally taken into account. Again, however, changes in institutional arrangements had little measurable impact on the pattern of trade. Britain's share of Hong Kong's total trade has declined continuously at least since the early 1960s, a fall that was largely unaffected by the actual dissolution of monetary and political linkages to the UK in 1972 and 1997, respectively. Trade with the US has accounted for about one-fifth of Hong

Kong's trade for most of the post-war period, but the share has fallen over the past two decades (i.e., *after* the establishment of the currency board), while the importance of trade with China has risen dramatically since 1978 (that is, long *before* the political handover).

Following Thom and Walsh (2002), I also perform regressions of the log of the countries' trade share on a time trend over a rolling window of 15 years.[7] Figure 3 plots the estimated trend coefficients (for both trade shares and the log of real trade). The results strongly confirm visual observations: changes in trade are unaffected by the changes in institutional arrangements. If anything, the evidence points in the opposite direction (of causality). Adjustments in institutional arrangements often occurred after a major redirection in bilateral trade flows. The importance of the UK as a trade partner for Hong Kong was already in clear decline when institutional linkages were dissolved; trade with the US and China strongly increased before institutional linkages took effect. In any case, the rates of increase/decline in bilateral trade tend to have *decreased* after regime changes, with parameter estimates of the trend variable getting closer to zero.

As another check, figure 4 presents the results of out-of-sample predictions for the evolution of the log of real trade after an institutional arrangement has changed. This test allows identifying structural breaks in time-series data. In line with the findings above, Hong Kong's trade with the UK has performed relatively better than expected. Bilateral trade growth (which was already disproportionately low when the institutional linkages were still in existence) is basically unaffected by the dissolution of monetary and political arrangements; the predicted trade values for the period after the break of institutional linkages are close to actual levels of trade. In contrast, bilateral trade with the US and China, countries to which Hong Kong established new institutional links, is considerably below predictions.

Table 1 presents accompanying estimation results. For each of the four regime changes, I regress the log of real bilateral trade on income controls and an intercept shift

[7] Similar results were obtained for longer windows.

variable that takes the value of one when a bilateral institutional linkage is in existence (and zero otherwise). Each sample consists of 43 annual observations for the period from 1960 through 2002. Without taking the precise estimates too literally, given the small sample size, it is interesting to note that *none* of the coefficients on measures of institutional linkages is significantly positive.[8] The point estimate on the US dollar linkage is even strongly negative, indicating that Hong Kong's trade with the US has fallen in magnitude after the establishment of the dollar-based currency board, holding constant for changes in incomes.

IV. Panel data evidence

While the time-series evidence is intriguing, a number of other factors may have affected the pattern of trade over time, thereby masking the effect of changes in institutional arrangements. For instance, changes in relative incomes or transport technology may have increased the attractiveness of bilateral trade with some trading partners (possibly at the expense of other countries). To account for these factors, I apply a conventional gravity model of trade, which has become the standard workhorse to analyze bilateral patterns of international trade. Anderson and van Wincoop (2003) provide a recent theoretical foundation.

The gravity model essentially relates the volume of trade between two countries to the economic size of these countries (with larger countries trading more) and the bilateral distance between them (with more distant countries trading relatively less). Bilateral trade flows are explained reasonably well by this very general framework. In addition, this set-up allows the estimation of the effect of other country characteristics on bilateral trade flows, including sharing common institutions.

[8] I have experimented, without much success, with a large number of modifications of this benchmark specification. For instance, I have added a linear trend variable, I have added a control variable for bilateral exchange rate volatility, and I have dropped the Hong Kong income variable (thereby increasing sample size). The results were robust to all these perturbations.

Since I am particularly interested in the effects of changes in institutional linkages over time, I use a specification of the gravity model that summarizes the effects of all time-invariant factors on trade in country-pair specific fixed effects variables, including the effect of bilateral distance on trade. In particular, I estimate an equation of the form:

$$\ln(T_{ijt}) = \alpha + \beta_1 \ln(Y_{it}) + \beta_2 \ln(Y_{jt}) + \beta_3 \text{ComCol}_{ijt} + \beta_4 \sigma(e_{ijt-1})$$
$$+ \gamma_1 \text{PolAnchor}_{ijt} + \gamma_2 \text{MonAnchor}_{ijt} + \Sigma_k \delta_k X_k + \Sigma_t \phi_t T_t + \varepsilon_{ijt}$$

where T_{ijt} denotes real bilateral trade between countries *i* and *j* at time *t*; *Y* is the real gross domestic product; *ComCol* is a binary dummy variable that takes the value of one if *i* and *j* are colonies with the same colonizer; $\sigma(e)$ is the standard deviation of the percentage change in the bilateral exchange rate over a year; $PolAnchor_{ijt}$ is a binary dummy variable that takes the value of one if *i* operates a political link to *j* at time *t*; $MonAnchor_{ijt}$ is a binary dummy variable that takes the value of one if *i* operates a monetary link to *j* at time *t*; *X* and *T* are comprehensive sets of country-pair and time specific fixed effects; and ε_{ijt} is a stochastic error. The coefficients of interest to me are γ_1 and γ_2; these coefficients capture the effect of changes in political and monetary arrangements on trade.

Data are taken from standard sources. As before, I obtain nominal trade values (in US dollars) from the International Monetary Fund's (IMF) Direction of Trade Statistics (DoTS). Following Glick and Rose (2002) and others, I use the four separate trade values reported in this publication for each bilateral trade pair[9] and compute the arithmetic mean for total bilateral trade. Trade is deflated by the US CPI for all urban consumers. Other data sources are the World Bank's World Development Indicators from which I obtain income data (in constant US dollars) and the IMF's International Financial Statistics from which I extract

[9] DoTS tabulates exports from *i* to *j*, exports from *j* to *i*, imports of *i* from *j*, and imports of *j* from *i*.

information on monthly exchange rates vis-à-vis the US dollar to compute bilateral exchange rates.

Estimation results are reported in table 2. The first column reports gravity fixed effects estimates for Hong Kong's external trade for the period from 1960 through 2002.[10] The overall fit of the regression is remarkable though not surprising, with an R^2 of 0.93; most of the variation in bilateral trade is captured by pair-specific fixed effects. Still, the standard gravity variables take on the expected sign and are statistically significant. Increases in incomes are positively and strongly associated with higher volumes of trade. Also, trade is higher when two countries share a common colonizer, while exchange rate fluctuations decrease trade. The main variables of interest, however, are the measures of political and monetary linkages to anchor countries. While the two γ coefficients are positive and of about the same magnitude, only the coefficient on the monetary linkage is statistically different from zero.[11] The point estimate of 0.29 indicates that the existence of a currency board linkage is associated with higher trade by about 33 percent (=exp[0.29]-1). Moreover, this effect goes beyond simply eliminating exchange rate volatility. Although considerably lower in magnitude, this estimate generally supports the findings in Rose (2000) and Glick and Rose (2002).[12]

Given the (negative) time-series evidence, however, there is reason to assume that this equation may be misspecified. More specifically, Hong Kong operates a currency board at the

[10] Restricting the panel to cover only trade of Hong Kong, country-pair fixed effects are essentially trading partner fixed effects. However, testing the robustness of the estimation results, I also extend the sample to cover trade of Macao and Singapore, two territories with history, size and structure comparable to that of Hong Kong. Since the key findings are unchanged, results are not reported.

[11] Equality of coefficients is rejected at any reasonable level of confidence.

[12] Again, I have performed a whole battery of standard robustness checks in estimating the gravity model. I have: a) used alternative panel estimators; b) analyzed exports and imports separately; c) dealt with zeros in the trade data in various ways; d) dropped GDP and exchange rate variables to increase sample size; e) analyzed various sub-periods; and f) extended the sample to cover more countries. The results are robust to these changes in the specification.

beginning of the sample period (with the UK) and the end of the sample period (with the US). If trade intensity with the UK has started from a high level and tended to decrease over time while trade intensity with the US (starting from a low level) has generally increased over the sample period, the monetary linkage variable could simply reflect these different trends in bilateral trade intensity.[13] To control for this possibility, column 2 splits the monetary linkage variable into separate variables for the sterling- and dollar-based currency boards and adds trend variables for trade with the UK and the US, respectively. As shown, Hong Kong's trade relationships with monetary anchor countries are indeed characterized by diverging trends. Once these trends are controlled for, the shift variables for periods of external monetary linkages are statistically indifferent from zero.

Column 3 reports, for comparison, the results of a conventional pooled OLS gravity regression (without fixed effects, but adding a control for bilateral distance). With this perturbation, the two γ coefficients increase in size and are statistically highly significant, illustrating the disproportionately large amount of Hong Kong's trade with the three anchor countries.

In another exercise, I perform separate gravity regressions for each single year in my sample, with fixed effects variables entered to capture the intensity of Hong Kong's trade with the three anchor countries of interest. Figure 5 plots the estimated coefficients; symbols mark point estimates that are statistically significant at the 5 percent level. Three observations appear to be particularly noteworthy. First, the coefficients are (mostly) significantly positive, indicating (once again) that Hong Kong's trade with countries to which Hong Kong operated in the past or currently operates an institutional linkage is disproportionately large over the sample period. Second, the intensity of trade with the UK, a country to which both the monetary and the political linkages have been dissolved, has declined over time. However,

[13] Berger and Nitsch (2005) argue along similar lines. They argue that the estimated trade effect of the European Monetary Union is a continuation of a long-term trend in trade integration.

this decline started already in the mid-1950s, that is, long before the first dissolution. Third, trade intensities with countries to which Hong Kong has recently established institutional links have also tended to decline. In sum, there is no evidence that institutional arrangements affect the pattern of trade.

V. Conclusions

Over the past few decades, Hong Kong has experienced various changes in its external political and monetary arrangements. In 1997, Hong Kong became a Special Administered Region of China, after having been a British crown colony for more than 150 years. The currency board mechanism, initially based on the pound sterling, was abandoned in 1972, but eventually restored in 1983, this time based on the US dollar.

I examine the impact of these political and monetary arrangements on Hong Kong's pattern of international trade. Applying various time-series and panel tests, I find no evidence of a redirection in Hong Kong's external trade after major institutional shifts. In contrast to previous studies, the evidence is based on both types of regime switches, exits and entries. Also, dissolved arrangements ended without any major turbulences or disruptions.

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Table 1: Time-Series Evidence on Hong Kong's Trade with Selected Partners, 1960-2002

	Monetary link		**Political link**	
Anchor country	UK	US	UK	China
Type of change	Exit	Entry	Exit	Entry
Log (GDP_i)	0.34*	1.28**	0.21	0.17
	(0.16)	(0.17)	(0.17)	(0.21)
Log (GDP_j)	1.32**	0.35	1.75**	1.68**
	(0.44)	(0.37)	(0.58)	(0.20)
Pound sterling dummy	0.02			
	(0.09)			
US dollar dummy		-0.20*		
		(0.08)		
UK colony dummy			0.10	
			(0.11)	
China SAR dummy				-0.57
				(0.16)
Adj. R2	0.96	0.99	0.96	0.98

Notes: OLS. Dependent variable is the log of real trade. Robust standard errors are in parentheses. ** and * denote significant at the 0.01 and 0.05 level, respectively. Number of observations = 43.

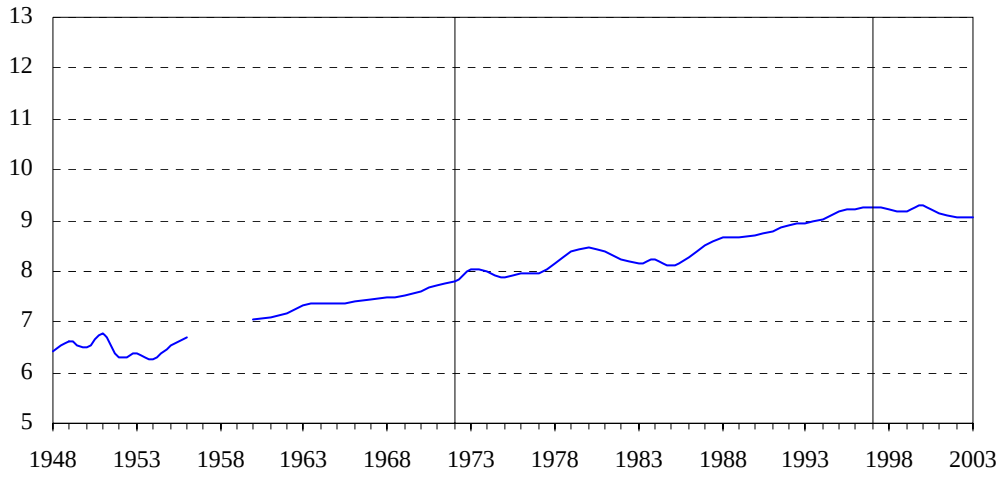
Table 2: Gravity Estimates of Hong Kong's Trade, 1960-2002

Monetary link	0.288**	0.917**
	(0.075)	(0.304)
Political link	0.251	1.205**
	(0.337)	(0.232)
Log (GDP_i)	0.503**	0.412**
	(0.068)	(0.044)
Log (GDP_j)	0.786**	0.917**
	(0.093)	(0.035)
Log ($Distance_{ij}$)		-0.956**
		(0.125)
Exchange rate volatility	-1.479**	-2.408**
	(0.503)	(0.657)
Colonial link	0.954**	1.391**
	(0.195)	(0.285)
Country-pair effects?	Yes	No
Year effects?	Yes	Yes
Adj. R2	0.93	0.76

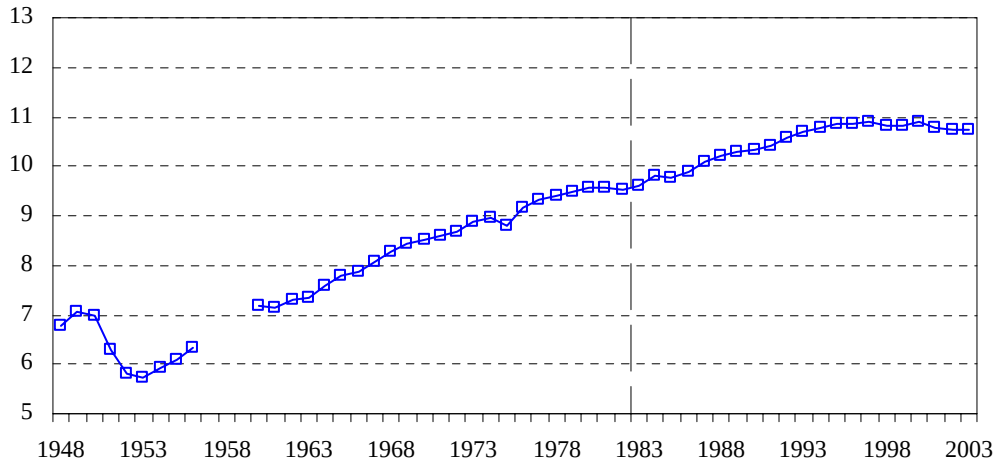
Notes: OLS. Dependent variable is the log of real trade. Robust standard errors are in parentheses. ** and * denote significant at the 0.01 and 0.05 level, respectively. Number of observations = 5201.

Figure 1: Hong Kong's Trade with Selected Countries

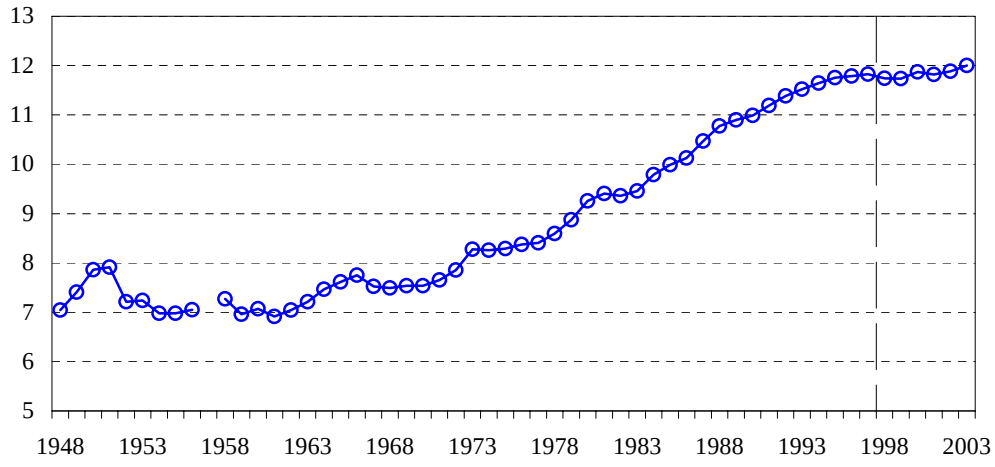
Hong Kong – United Kingdom



Hong Kong – United States



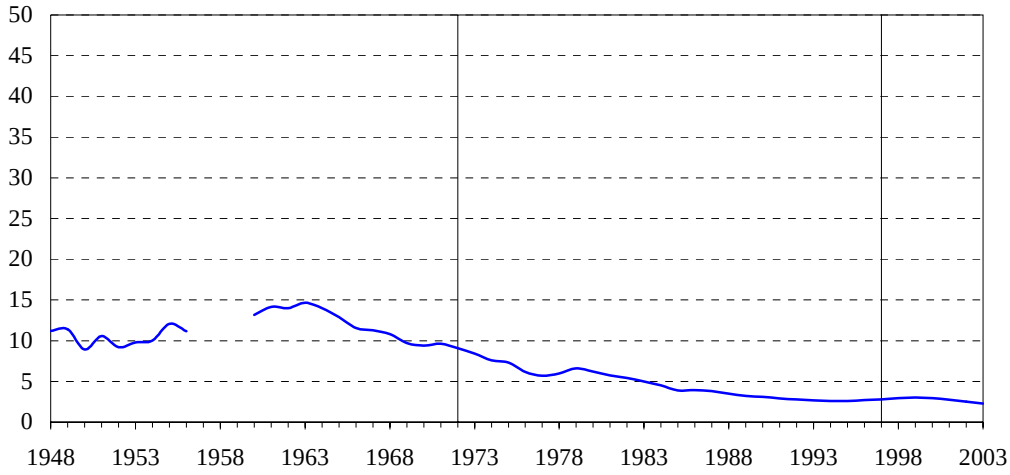
Hong Kong – China



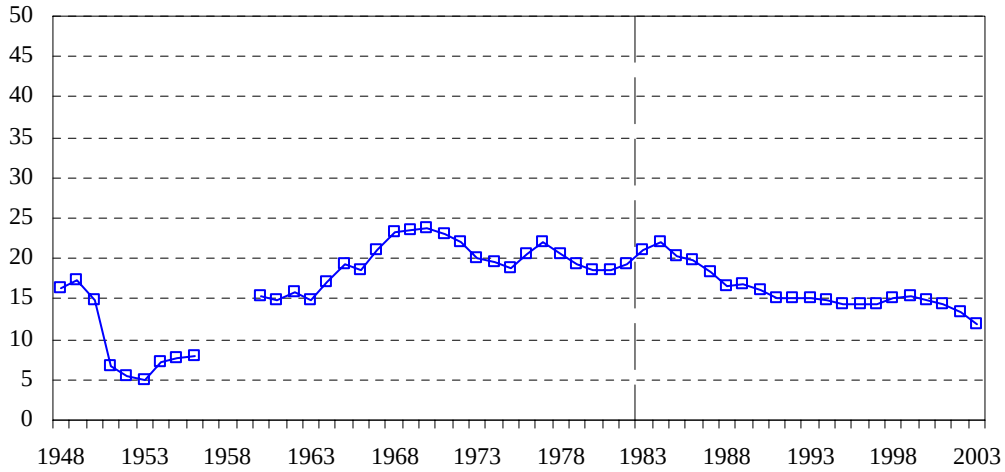
Notes: Data from DoTS (sum of exports and imports from Hong Kong's country page); 1995 dollars; logs.

Figure 2: Shares of Selected Countries of Hong Kong's Trade

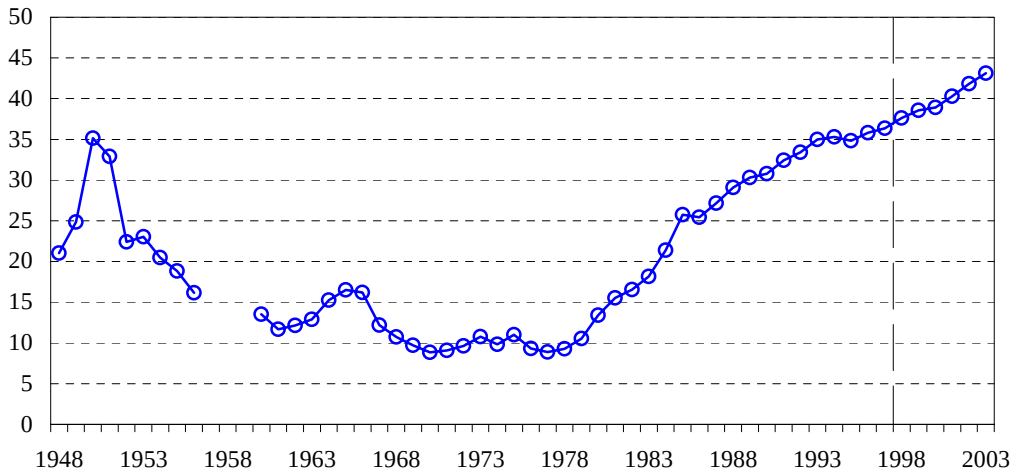
Hong Kong – United Kingdom



Hong Kong – United States



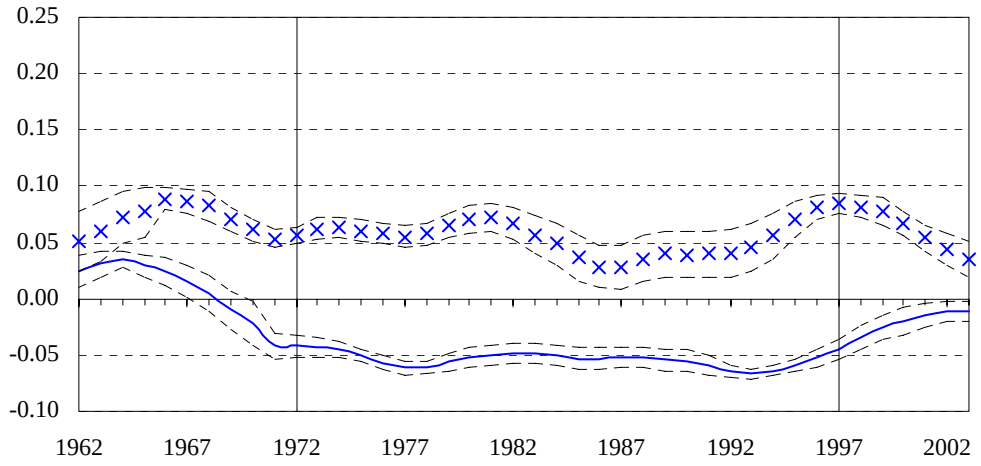
Hong Kong – China



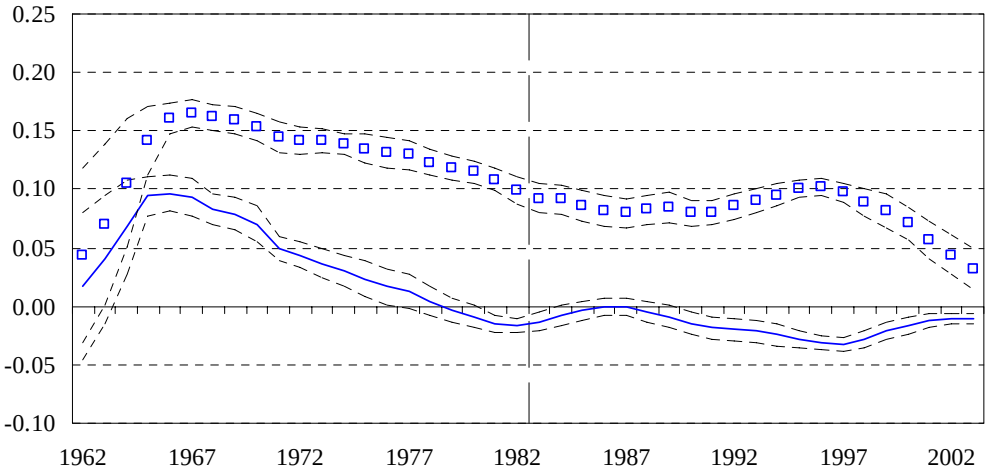
Notes: Data from DoTS; bilateral exports and imports as percentage of Hong Kong's total trade.

Figure 3: Trend Coefficients (rolling 15-year intervals)

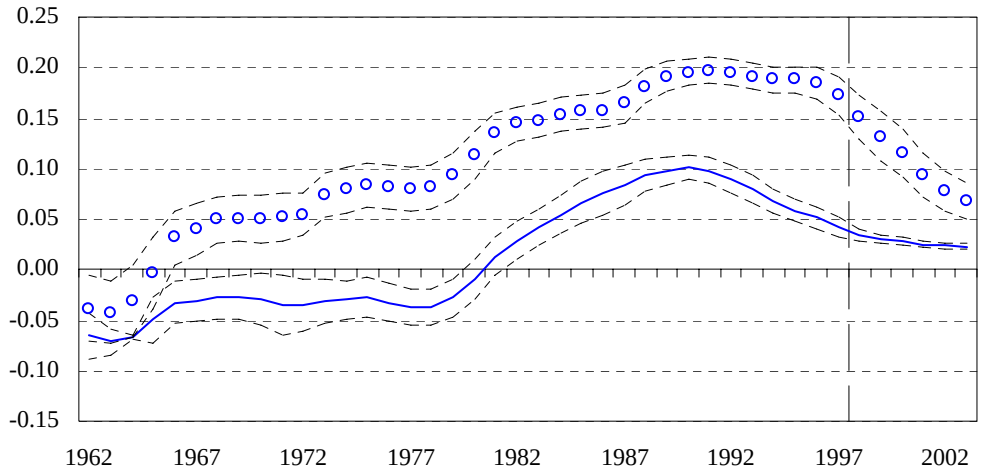
Hong Kong – United Kingdom



Hong Kong – United States



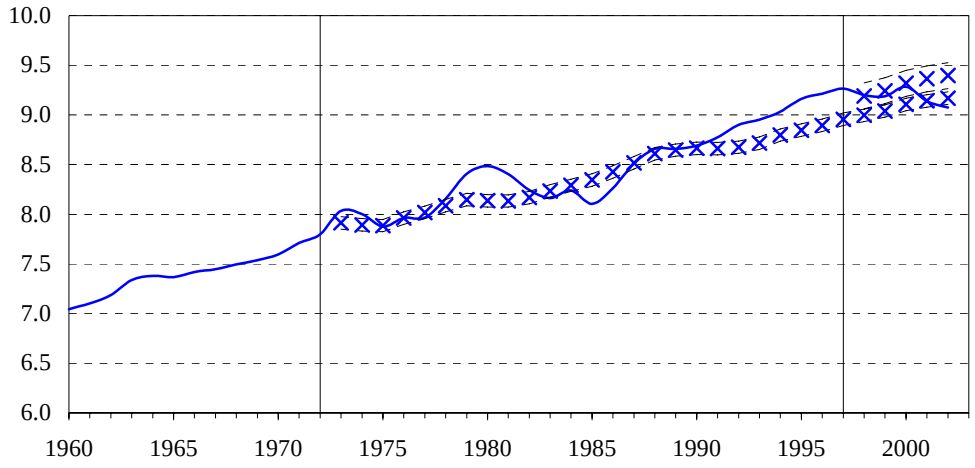
Hong Kong – China



Notes: Symbols show trend coefficients for log of real trade, lines for shares; dotted lines show +/- s.e. bands.

Figure 4: Out-of-Sample Predictions

Hong Kong – United Kingdom



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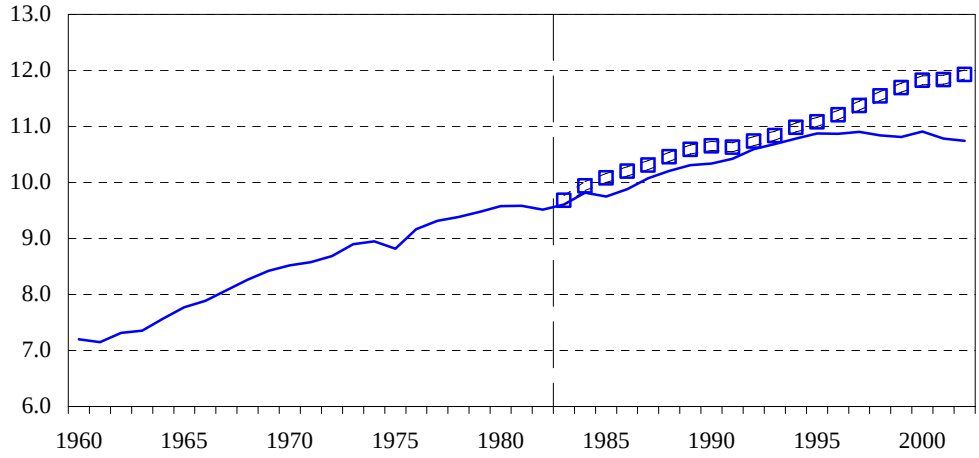
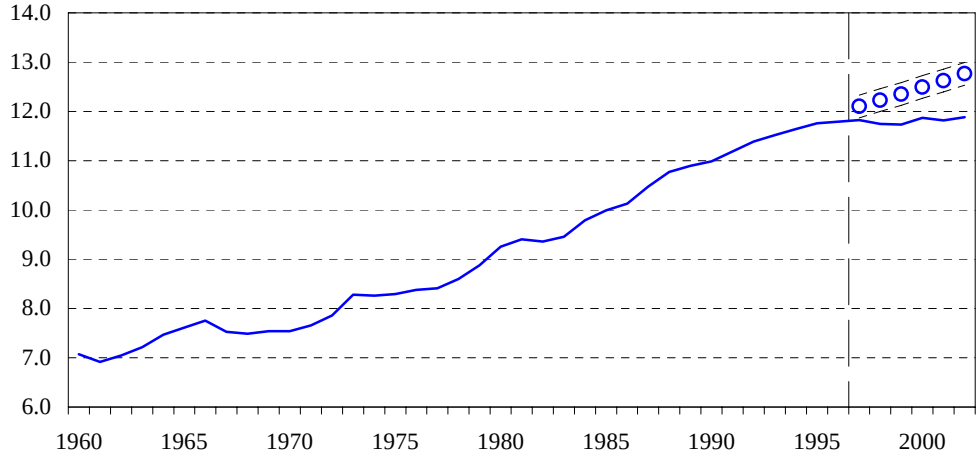


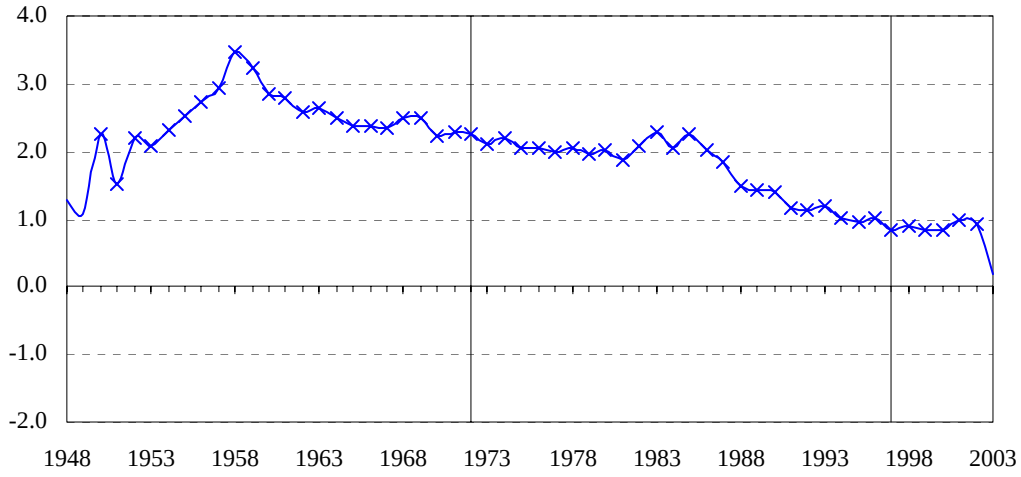
Hong Kong – China



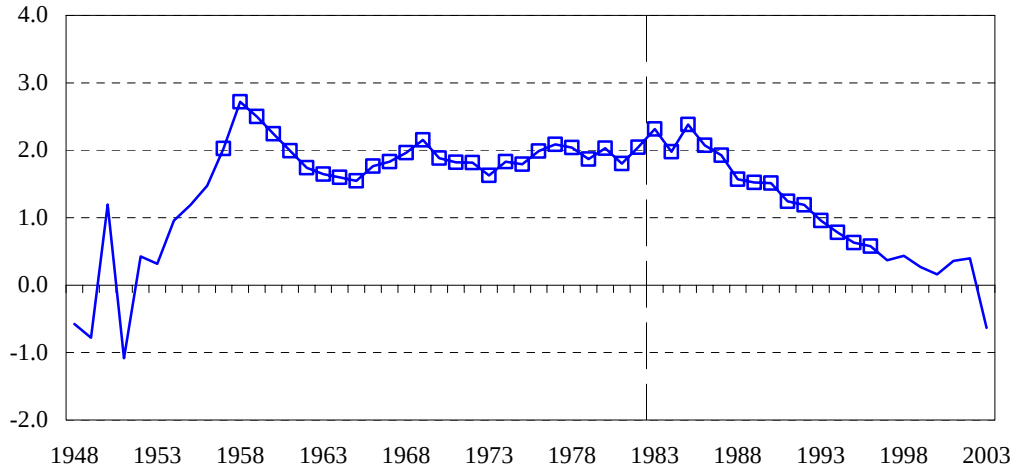
Notes: Actual (lines) and predicted (symbols) volumes of bilateral trade; 1995 dollars; logs.

Figure 5: Gravity Estimates (yearly regressions)

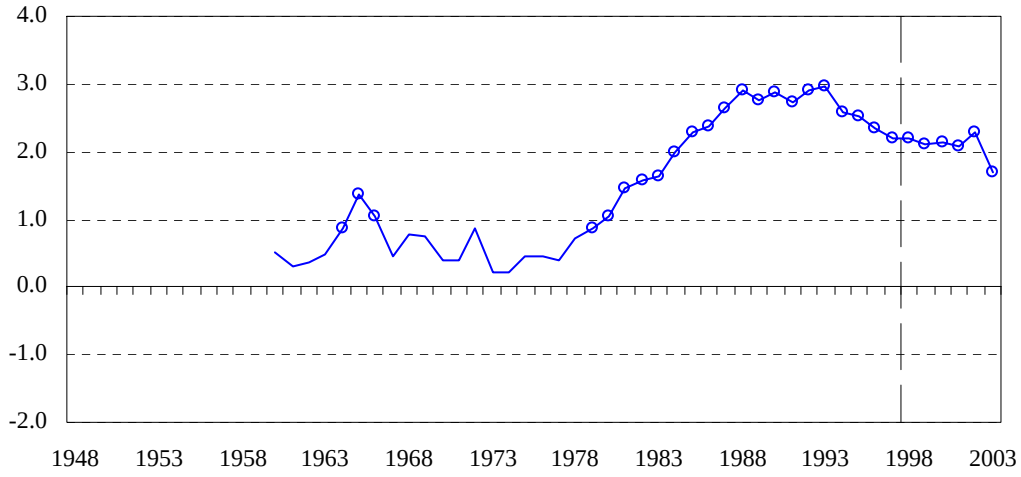
Hong Kong – United Kingdom



Hong Kong – United States



Hong Kong – China



Notes: Estimated country effects from yearly gravity regressions. Symbol indicates significance at the 5% level.