5-1-2006

The Role of Ethnic Chinese Networks in China's FDI Inflows

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December 2005

Abstract

The literature has shown that social networks can promote international trade and investment by acting as a substitute for formal market institutions. The question to what degree strengthening formal institutions affects the role of social networks has yet to be addressed empirically. Using cross-sectional data this paper examines whether the role of ethnic Chinese networks in promoting bilateral FDI inflows into China diminishes as China continues to implement legal, economic and political reforms. The findings are ambiguous; while results for the entire period (1984-2003) suggests that, if anything, the role increases, a look at a more recent sub-period (1992-2003) suggest that the role does as expected decrease.

I.   Introduction[1]

"What is the most important thing for doing business in China? *Guanxi*. You must have connections. China is not like Hong Kong. There is no law to follow."

Representative of a large Hong Kong conglomerate in 1994 (in Wang, 2001:87)

"Without *guanxi*, what can you do? Nothing!"

Official at the Japanese Business Association in 1994 (in Wang, 2001: 87)

Guanxi, which means interpersonal connections and relationships, have long been considered to be of paramount importance for successfully conducting business in China, especially for foreigners. In the presence of a weak institutional environment, social networks are considered a substitute for formal market institutions and especially the rule of law. Ethnic networks of overseas Chinese are thus ascribed a special role in promoting foreign direct investment (FDI) into China because of their connections with and in China. This role of social networks in promoting international trade and investment has attracted increasing research interest in recent years. Yet, the question to what degree social networks and formal institutions are substitutes as stronger formal institutions emerge has yet to be addressed. Does the role of social networks in promoting trade remain as important once formal institutions strengthen?

This paper examines the hypothesis that overseas Chinese networks have an explanatory power for bilateral FDI inflows into China and that this explanatory power

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diminishes over time as China continues to implement legal, economic and political reforms. It proceeds as follows: After providing some background on the evolution of FDI inflows into China and the nature of Chinese ethnic networks, I turn to a review of the literature. This review is subdivided into three parts. The first part explicates the basic theory of how social networks can overcome barriers to trade and investment. The second part summarizes previous empirical literature on the role of overseas Chinese networks in affecting international trade and investment. The third part briefly explicates the theory behind traditional determinants of FDI in order to provide a theoretic basis for my specification. I will then discuss the conceptual and actual model that I employ to examine my hypothesis. The following two sections consider the ideal and actual data used to examine the stated hypothesis. The results of my analysis are presented subsequently. The paper concludes with a summary of my examination.

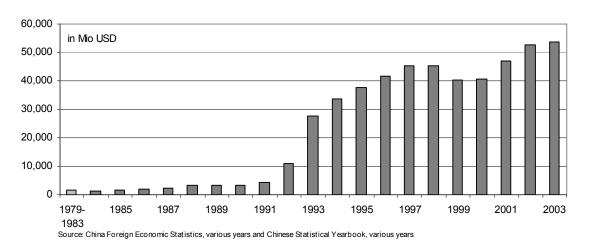## II. Background on the Evolution of FDI inflows into China[2]

Until the endorsement of economic reforms and the open-door policy by the Party Congress in 1978 China followed an economic strategy of autarky.[3] FDI inflows into China are thus a phenomenon of China's reform era. Within 25 years China went from no FDI to being the most popular destination for FDI in 2003, surpassing the United States

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[2] This section heavily draws on the first chapter in Fu (2000) who provides a detailed account of the regulatory framework governing FDI in China. Unless otherwise noted, Fu (2000) is the source of information.

[3] Fu (2000) points out that although foreign firms operated in China since the Opium War of 1838-1840 they were all driven out with the establishment of the PRC in 1949. Since then, the only meaningful foreign economic relation was with the former Soviet Union in 1950s. As political relations worsened in the early 1960s economic ties between those two states were cut off.

as largest recipient of FDI inflows for the first time (BBC News, 2004/06/28). From 1979 to 2003 China attracted nearly 500 billion USD in actual FDI from more than 150 countries/ regions around the world.

Graph 1: Annual FDI Inflows into China, 1979-2003

Source: China Foreign Economic Statistics, various years and Chinese Statistical Yearbook, various years

Since the promulgation of the first foreign investment law in 1979, commonly known as the Equity Joint Venture Law (EJV Law), China's regulatory framework for FDI has evolved significantly. This evolution can roughly be outlined in four phases. The first phase, 1979 to 1984, was marked by the promulgation of the EJV Law and the establishment of four Special Economic Zones where foreign investors enjoyed a number of preferential treatments. It should be noted, though, that the EJV Law was "more a statement of principles than a well-defined legal code [and] sketchy both in form and substance" (Fu 2000: 29). Yet, considering that China had until recently condemned capitalism and foreign ownership it was a significant move. It is not surprising therefore

that FDI inflows, with an accumulated value of 1.8 billion US$, were insignificant during this initial phase.

As China stepped up its efforts to promote FDI inflows in the second phase, 1984 to 1990, inflows started to become considerable in volume. During this time, China dramatically expanded the geographical areas open to foreign investment. By the end of 1989 over 300 cities and counties all along China's coast were part of the Special Investment Areas.[4] Concurrently, China improved its regulatory framework. Among other things, it reformed its rigid foreign exchange regime and formally legalized wholly foreign owned enterprises.

The events at Tiananmen Square in 1989 cast China's commitment to its economic and political reforms and open-door policies into doubt. However, by further opening up in 1990 China diverted those fears and entered into its third phase. During the next years it lifted the ban on foreigners from holding the chair of joint ventures, opened up a number of sectors to FDI that were previously off-limits, and continued to increase the transparency of its regulatory framework. China's bid for joining the World Trade Organization (WTO) and integrating into the world economy were clearly a driving force behind its further liberalization and acceptance of international FDI regime (Wang, 2001).[5]

China's accession to the WTO in 2001 marks the latest phase. In 2000/2001 it revised its regulations governing the FDI inflows once again. Among other things, major revisions led to a loosening in foreign exchange balancing requirements and further

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[4] Special Investment Areas is a generic term that refers to all areas officially designated for foreign investment.
[5] International FDI regime refers to multilateral agreements concerning FDI such as agreements regarding the protection of property rights or dispute settlement bodies as well as bilateral investment treaties. For further information on China's integration into the international FDI regime see Wang (2001) or Fu (2000).

liberalization in the sectors open to FDI inflows. This trend is expected to continue in the next years as China is to deliver on its WTO commitments (Bulcke et al, 2003).
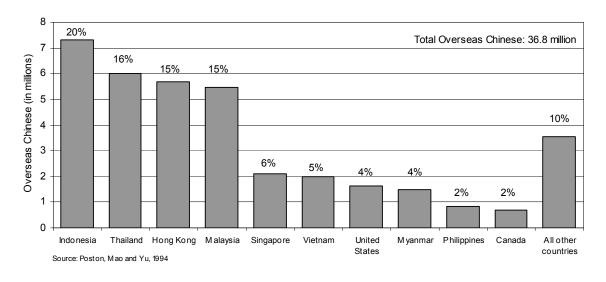
Although China's regulatory framework governing FDI inflows has gradually improved since its inception, foreign investors still face considerable institutional problems due to the absence of an effective legal system (see for example Bulcke et al, 2003 or Wang, 2001). Based on extensive interview data Wang concludes that

> "ambiguities and contradictions of law, the lack of transparency, and weak legal awareness on part of Chinese officials constitute serious obstacles for business negotiation and operation. Contracts are frequently undermined by changing policies and laws as well as renegotiation. The lack of independence and competence of the court system means that it is difficult to achieve fair legal settlement of commercial disputes." (Wang, 2001: 81f.)

This suggests that foreign investors in China (still) face considerable informal barriers despite improvements in the regulatory framework and the strengthening of the legal environment. How social networks can help to overcome these will be examined below. First, however, I will present some information on the dispersion and number of overseas Chinese to provide an understanding for the extent of the ethnic Chinese network.

III. Background on Chinese Networks

Chinese are widely spread around the globe, residing in virtually every country of the world. It is estimated that in the late 1990s there were more than 31 million Chinese living in 76 countries outside of China[6] and Taiwan. This is thought to comprise more than 98 percent of all overseas Chinese.[7] Among those 31 million about 85 percent live in Asia and over 10 percent in the Americas, with the rest spread across Europe, Africa, and Oceania. Of those living in Asia, 75 percent, or 18 million, live in just three countries: Indonesia, Thailand and Malaysia (Poston, forthcoming).

Graph 2: Ten Countries with largest Overseas Chinese Population and Percent of World Total of Overseas Chinese, around 1990

Source: Poston, Mao and Yu, 1994

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[6] Including Hong Kong and Macao. Hong Kong, a former British colony, was handed back to China in 1997, Macau, formerly under Portuguese rule, in 1999.
[7] Definitions of who is an overseas Chinese differ from source to source. Poston (forthcoming) notes that "no definition is unfailingly sharp and concise because the decision on whether or not a person or group is overseas Chinese tends to be made by governments, both Chinese and foreign, by the individual persons themselves, by the larger societies alongside and within which the Chinese settlers live, and by individual scholars."

Chinese networks encompass both formal and informal associations. Based on family, kinship, and other types of common bonds they provide a way for Chinese business people to obtain information and enforce contracts through informal channels (Wang, 2001 and Hamilton, 1996). The strength of those networks is underlined by the formation of large-scale formal international associations. Since the 1960s more than 100 world conventions of overseas Chinese have been held (Gao, 2003); these include the World Chinese Entrepreneurs Convention which has brought together over 1000 major business figures periodically since 1991 (Mackie, 1998).

IV.   Review of the Literature

1. Basic Theory on the Role of Co-ethnic Networks

Social networks in general and co-ethnic networks in particular are economic, though non-market institutions that can reduce agency and other transaction costs and thus help to overcome informal barriers to trade. With his work on the Maghribi traders that operated in the Mediterranean region in the 11th century, Greif (1989, 1993) established in the literature that co-ethnic networks can promote international trade and investment through the provision of community sanctions that deter contract violations in weak legal environments.

Gould (1994) and Rauch and Cassella (1998) stress another channel through which co-ethnic networks promote international trade and investment by reducing agency

and transaction costs. Their works emphasize the role such networks play in providing and relaying information as well as supplying matching and referral services. The provision of such services through networks significantly lowers the cost associated with trading with or investing in foreign environments with a weak legal infrastructure. Gao (2003), in the context of FDI in China, adds that this is also important in an environment where foreign investors are to a high degree unfamiliar with the host country's regulations, language, and customs.

Social networks are thus expected to promote trade with and foreign investment into their home countries. As market institutions and especially the rule of law strengthen, however, the role of social networks in promoting trade and foreign investment is expected to diminish.

2. Previous Empirical Research

The role of co-ethnic networks in overcoming barriers to trade and investment has attracted increasing research interest in recent years. Of the co-ethnic networks active in the promotion of international trade and investment, the overseas Chinese have received special attention. This is due in part to the sheer size and quality of the Chinese network (Rauch and Trinidade, 2002) as well as to China's role in the world economy (Wang, 2001). Empirical research on ethnic Chinese networks can be subdivided into two strands, descriptive and econometric evidence. Because research in this field is still in its initial stages, few studies exist as of now, especially with regard to econometric analyses.

Descriptive Evidence

Using extensive interview data from 1994, 1995, and 1998 Wang (2001) documents how personal connections, *guanxi*, facilitate FDI inflows into China. She concludes that overseas Chinese have been a major source of FDI inflows because their cultural and organizational advantage as well as their concrete personal connections and ancestral roots enable them to utilize *guanxi* effectively to protect their investment interest in China.[8] In addition, she also finds evidence that overseas Chinese serve as a

> "bridge between China and the rest of the world [in that they] facilitate the understanding of and access to *guanxi* networks by other foreign investors. Without the agency of ethnic Chinese, it would have been much more difficult for foreign companies to use informal personal networks to complement and compensate for the weak formal legal institutions in China" (Wang 2001:161). [9]

In a similar vein Weidenbaum and Hughes (1996) and Hamilton (1996) document how co-ethnic Chinese networks lower transaction and agency costs in China's weak legal environment and how their exploitation of personal networks gives them an advantage over other foreign investors.

Econometric Evidence

On the econometric front, three papers are relevant to the issue at hand. Fu (2000) examines how formal institutions, i.e. the legal framework governing FDI in China, affect total realized FDI inflows into different provinces in China. Because he defines formal

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[8] Wang (2001: 143) points out that *guanxi* networks are accessible to non-Chinese, however, because of the relative disadvantage they have compared to Chinese they are far less effective to utilize them.
[9] In a footnote to this passage Wang (2001) notes that similar to China, Vietnam has also benefited from the existence of a large overseas population in attracting FDI. She speculates that lack of such an overseas population may be a major reason why Russia has had little success in attracting FDI although it has a natural and human resource endowment as well as market potential comparable to China.

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institutions as the inverse of informal institutions, i.e. Chinese networks, his results

provide some indication of the effect Chinese networks have on FDI inflows. Fu creates

what he refers to as periodized spatial model that allows him to examine FDI inflows into

each of the 29 provinces for three different time periods (1979 to 1984; 1985 to 1990; and

1991 to 1996; not disaggregated by source country) as a function of informal institutions

as well as economic advantages using a simple OLS specification. He approximates

informal institutions by measuring the kilometer distance between provincial capitals to

Guangdong, Shanghai, and Fujian, taking the shortest distance as the initial valid value.[10]

The rationale for this approximation is that overseas Chinese business communities are

dominated by natives from those three provinces and that with spatial distance to those

three provinces the strength of the effect of Chinese networks decreases because of strong

cultural differences between different regions in China. As expected, the coefficient on

this variable decreases over time and simultaneously becomes also less statistically

significant suggesting that the importance of Chinese networks in affecting FDI inflows

has decreased.

Gao (2003) examines how ethnic Chinese networks affect realized FDI inflows

into China by looking at the cumulative FDI inflows from 68 countries over the period of

1984 to 1997. Cumulative FDI inflows during this period reflect basically the FDI stock

as inflows before 1984 were negligible. Controlling for traditional determinants of FDI as

suggested by the knowledge-capital model,[11] Gao uses a standard OLS regression with

the logged value of FDI stock as dependent variable. He finds that Chinese networks –

approximated by the ethnic Chinese population share in the source country – have a

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[10] For non-coastal provinces the value is weighted by the factor two as coastal regions are expected to be in greater contact with the outside world and thus with potential foreign investors than interior provinces.
[11] The capital-knowledge model is discussed in following section on traditional determinants of FDI.

statistically significant positive relationship to FDI in China. Over a variety of different specifications his results suggests that a one percentage point increase in the ethnic Chinese population share leads to a increase of at least 3.7 percent in cumulative FDI in China. Although Gao believes that the FDI stock better represents the activity of foreign firms in China than FDI flows, he also regresses annual FDI inflows for 1994 to 1997 against his measure of Chinese networks. He finds a significant positive relationship of the magnitude of a 4.0 percent (1995) to 7.4 percent (1996) increase in FDI inflows for a one percent increase in the Chinese population share in the source country.

Rauch and Trindade (2002) also examine the role of Chinese networks, however, in the context of bilateral trade. Although their work does not directly relate to the hypothesis examined here in that it investigates the strength of the international links of Chinese networks it nevertheless provides evidence that Chinese networks make a difference and indeed seem to be able to provide the services discussed in the theory section. Using a standard gravity model for bilateral trade and controlling for colonial ties and common birth language they examine separately the effect Chinese networks have on promoting bilateral trade in three different groups of commodities: organized exchange, reference-priced, and differentiated commodities. Employing a threshold Tobit model as estimation technique they find that the coefficient of their Chinese network variable is significantly positive for all commodity groups for the two years, 1980 and 1990, covered in their data set. Rauch and Trindade use two different measurements for the strength of Chinese networks: The first one is the probability that if an individual is randomly selected from each country, both will be Chinese (product of the ethnic Chinese population shares for each country pair). Rauch and Trindade find a significant positive

relationship between this measure and the dependent variable, the logged value of bilateral trade. The second one is the number of potential international connections between the ethnic Chinese populations of the trading partners (product of the two respective Chinese populations). Entered as a quadratic, the second measure is able to capture – and does indeed show - diminishing returns to the size of ethnic networks. For country pairs with significant ethnic population shares Chinese networks on average increase bilateral trade in differentiated goods by 60 percent. Because of changes in the subsample of country pairs and data for only two years, their study is not well suited for conclusions of time trends, as the authors point out.

3. A Brief Review of Traditional Determinants of FDI

In order to isolate the effect of social networks on China's FDI inflows, other determinants of FDI inflows must be controlled for. The literature on determinants of FDI is "quite substantial, though arguably still in its infancy" (Blonigen, 2005: 29). In his recent *Review of the empirical literature on FDI determinants* Blonigen concludes that the interaction of FDI and trade flows as well as the underlying motivations for multinational firms to invest abroad makes analysis difficult.[12] There are no agreed models guiding the empirical analysis (see for example Singh and Jun, 1995, Chakrabarti, 2001, and Bevan and Estrin, 2000).[13] Nevertheless, some stylized facts have emerged in literature on country determinants.

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[12] For a comprehensive overview on the theory of the behavior of multinational firms and determinants of FDI see for example Barba Navaretti and Venables (2004).

[13] "Table 1: How Confusing is the Evidence" in Chakrabarti (1999) tellingly illustrates this point. Looking at eight proposed determinants of FDI the table lists studies according to whether they have found a

The literature distinguishes between two reasons why a firm would want to invest abroad. One is to take advantage of international differences in factor prices by splitting the production process between several locations. This is referred to as vertical FDI and was first modeled by Helpman (1984). The other, horizontal FDI, is to avoid costs associated with cross-border trade by supplying a market directly by an affiliate. Markusen (1984) provides an early model for FDI motivated by the latter reason.

Models generally include relative market size of the home and host country, relative factor endowments – especially with regard to labor –, and trade and transport costs as country specific determinants of FDI. Market size captures horizontally motivated FDI because the larger the market, the more attractive it is for a firm in search of new market opportunities to supply that market. Market size is generally captured by total GDP, however, some include GDP per capita instead or as well. The rationale for including GDP per capita is that besides the overall market size the level of individual purchasing power matters. Root and Ahmed (1979) have pointed out that total GDP may be a poor indicator of market opportunities, especially for developing countries, as it reflects the size of the population rather than income. Labor costs, on the other hand, reflect vertically motivated FDI: the lower the labor costs the more attractive it is for a firm to invest in the host country. Since the lower labor costs are only of interest to firms if they are not compensated by lower productivity, this variable is generally captured by a measure of unit labor costs. Lastly, higher trade and transport costs – often proxied by distance – may encourage horizontal FDI to avoid those costs and simultaneously

positive, negative, or insignificant relationship for each determinant. See his paper also for a review of host country FDI determinants.

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discourage vertical FDI as higher shipping costs back to the home make production abroad less attractive.

The two motivations for FDI, however, give conflicting predictions about how some country characteristics affect FDI. The theory of horizontal FDI predicts a positive relationship between the volume of FDI and similarity in country characteristics between source and destination countries, while the theory of vertically motivated FDI predicts a negative relationship. Conflicting predictions also arise for trade costs: whereas the theory of horizontal FDI predicts a positive correlation, theory predicts a negative correlation for vertical FDI (Barba Navaretti and Venables, 2004).

One way in which the literature addresses the problem of conflicting predictions is to specify an empirical model that encompasses both theories.[14] A model that accounts for both vertical and horizontal FDI is the knowledge-capital model by Markusen (most fully developed in Markusen 1997, 2002)[15] and estimated by Carr, Markusen and Maskus (2001). The knowledge-capital model represents an analytical formalization of the OLI framework as developed by Dunning (1977, 1981) which states that a firm invests abroad if it has market power through the ownership (O) of products or production process; it has a location (L) advantage if producing abroad; and lastly it has an advantage internalizing (I) their foreign activities rather license or selling its products or process to a foreign firm.

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[14] There are two other ways in which the literature on FDI determinants addresses the problem of conflicting predictions. The first is to accept that FDI data contains both types of FDI and that regression analysis reports an averaged effect. The second one is to split FDI data between vertical and horizontal FDI. The second approach might be the theoretically most sound specification, however, the separation of FDI data is generally not possible (Baraba Navaretti and Venables, 2004).

[15] See for example Barba Navaretti and Venables (2004) for a literature review of other works that have contributed to its development.

Carr, Markusen and Maskus specify their regression equation for the knowledge-capital model as

(1)   Affiliate Sales = $\beta 0 + \beta 1*$(GDP Sum) + $\beta 2*$(GDP Difference)^2 + $\beta 3*$(Skill

Difference) + $\beta 4*$(GDP Difference * Skill Difference) + $\beta 5*$X

where affiliate sales measures the engagement of a firm abroad and X represents a vector of independent variables measuring trade costs and investment barriers, for example through geographical distance.[16] Note that affiliate sales capture the same concept as FDI flows, namely the extent of operations a firm carries out abroad (Barba Navaretti and Venables, 2004); it thus is an alternative measure used in the literature.

The first two variables, the joint market size of the home and host country and the squared difference in home and host GDP, refer to horizontally motivated FDI. While theory predicts there to be a positive relationship between joint market size and affiliate sales, the relationship with the squared difference in GDP is predicted to be negative. That is because the second variable captures the similarity/dissimilarity in country size and theory suggest an "inverted U-shaped relationship to differences in country size, with a maximum at zero difference" (Carr, Markusen and Maskus, 2001: 698).

The third and fourth variable, the difference of skilled-labor abundance between home and host country and the interaction term between this skill difference and the

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[16] Carr, Markusen and Maskus (2001) also use index measures of perceived investment costs and trade costs in the host country as well as trade costs in the home country as variables. Over a range of different specification they find trade costs in the source country to not have a significant impact. Trade costs in the host country are significant, except in one specification. The investment cost variable for the host country is significant. Since this paper deals with only one host country, China, however, the host trade and investment cost variables have the same value for all observations in a cross section of the data.

difference in GDP between home and host country, can refer to both the horizontally and vertically motivated FDI theories. The theory of horizontal FDI predicts that the coefficient sign on the third variable is negative as horizontal FDI would be promoted by similarity in labor skill levels between home and host country. The theory of vertical FDI, on the other hand, suggests that affiliate sales increase as the difference in relative skilled labor endowments increase, i.e. a positive relationship. Carr, Markusen and Maskus expect the coefficient sign to be positive because they believe it is reasonable to assume that multinational firms are headquartered in the relatively more skilled-labor country. That is to say, that they believe the vertical model of FDI dominates in this variable. Their empirical findings support this assertion; however, other authors applying the model to different datasets have found both negative and positive relationships (see Barba Navaretti and Venables, 2004). Carr, Markusen and Maskus theorize the coefficient of the fourth variable to be negative as a small country with a relatively high skilled labor endowment is expected to have the highest affiliate sales.

As already pointed out, the expected sign on the coefficient for trade and investment is ambiguous since the theories for horizontal and vertical FDI give conflicting predictions. In the case of the geographical distance, distance increases trade costs which would imply a negative correlation in the case of vertical FDI but a positive one in the case of horizontal FDI.

Markusen and Maskus (2002) conduct a formal test of the knowledge-capital model against models that account only for horizontal FDI or vertical FDI using panel data (1986 to 1994) on FDI activity by US firms or foreign firms in the United States.

They find that the knowledge-capital model outperforms the vertical FDI model, but not the horizontal model. The horizontal model performs equally well as the capital-knowledge one. Considering that the data they test their hypothesis with is from a time period in which the literature suggests that horizontal FDI was the dominant form of FDI, this finding is consistent with our expectations. More recently, however, the literature suggests that in the late 1990s vertical FDI has been gaining some prominence at the expense of horizontal FDI. No test of the knowledge-capital model has been performed on more recent data to test this proposition (Barba Navaretti and Venables, 2004). Given this development the capital-knowledge model is preferable to use in the context of this paper.

V.   Conceptual and Actual Model

The role of social networks in China's FDI inflows can thus be conceptually modeled as

FDI = f (social network, traditional determinants of FDI)

where the social network is the variable of interest and traditional determinants of FDI act mainly as control variables.

My empirical specification is informed by Gao (2003) and the capital-knowledge model proposed by Markusen (1997, 2002) and its empirical specification as put forward

by Carr, Markusen and Maskus (2001). Data limitations unfortunately prevent me from including the relative skilled labor abundance variable as proposed by Carr, Markusen and Maskus (2001).[17] I therefore drop the two variables including relative skilled labor abundance and instead include the difference in GDP per capita, both as a proxy for labor cost differentials and to include a per capita measure of market size similarity similar to Gao (2003). My basic empirical specification is thus of the following form:

(2) $FDI_{ijt} = \beta 0 + \beta 1*(GDP_{it} + GDP_{jt}) + \beta 2*(GDP_{it} - GDP_{jt})^2 + \beta 3* (PCGDP_{it} -$
$PCGDP_{jt}) + \beta 4*Distance_{ij} + \beta 5*(Chinese\ Network_{it})$

where i and j denote the source country and China, respectively, and t time. FDI denotes the inward FDI into China from the respective source country. The first independent variable is the joint market size as measured by the sum of real GDP in the source country and China. The expected sign on this coefficient is positive. The next variable measures the squared difference in real GDP between the source country and China. The expected coefficient sign is negative. The difference in per capita GDP between the source country and China is the third variable. Due to the conflicting predictions by the theories on vertical and horizontal FDI, the sign for this coefficient is ambiguous. The fourth variable captures the geographical distance between the source country and China. Again, due to conflicting predictions by the theories for horizontal and vertical FDI, the

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[17] The limiting factor is data on the skilled labor abundance in China. The International Labor Office does not report data on this variable for China. Gao (2003) circumvents this problem by only looking at the relative skill abundance for a single year and is thus able to treat the skilled labor abundance in China as a constant. Instead of using relative skilled labor abundance in the regression he directly uses the value of skilled labor abundance in the FDI source country. Since I attempt to look at how the effect of Chinese networks on FDI evolves over time, I would need data on skilled labor abundance in China for multiple points in time and therefore cannot replicate his approach.

expected coefficient sign is ambiguous. The last variable captures size of the Chinese network in the source country and is expected to be positively correlated to FDI inflows into China.

VI.   Ideal Data

As any model, the reliability of its estimate depends on how well the variables capture what they are supposed to capture. The most important measurement issue concerns how to approximate the strengths of Chinese networks. Ideally, I would not only measure the existence and size of a network in each country but more specifically its "strength," i.e. the extent of contact the overseas community has with China and the level of entrepreneurial activity. Unfortunately, the data requirements for such are prohibitively high. Following Gao (2003), I will instead use the share of overseas Chinese as percentage of the source country population to approximate the relative strength of Chinese networks. The rational is that the higher the percentage share, the more likely it is that there exists a strong Chinese network.

Measuring realized FDI is another area of concern. While measuring realized FDI is straightforward in that it is reported by statistical bureaus – in the context of inward FDI to China by the State Statistical Bureau – the breakdown by country may be somewhat skewed by 'round-tripping' investment (Liu et al, 1997, Dees, 1998, and Prasad and Wei, 2005). Foreign investment might thus in fact be domestic investment that is round-tripped to take advantage of preferential tax treatment and other privileges

available to foreign investors. While it is hard to estimate the extent of round-tripping, much of it is believed to go through Hong Kong. The declining share of FDI inflows from Hong Kong, however, suggests that this share might be declining over time (Prasad and Wei, 2005). A reason therefore might be the strengthening of institutions and a more equal treatment of foreign and domestic investors. If round-tripping behavior occurs primarily by cooperation with overseas Chinese – as suggested by Lui et al (1997) – then the skewed breakdown is not a major concern for the purpose of this paper as it would support the hypothesis that social networks have an explanatory power for FDI inflows into China.

The theory of vertically motivated FDI suggests that productivity adjusted labor costs play an important role in a firm's decision where to locate part of their production process. Ideally, this could be measured. Unfortunately, data on this variable are hard to come by. Although the International Labor Office publishes annual data on wage costs and wages, the data can be described as incomplete at best. Data for all or most years is missing for almost every emerging market country considered here and, crucially, not available for China. In absence of any better data, per capita GDP seems to be the closest (not productivity adjusted), though imperfect proxy for labor costs. It should be noted that per capita GDP at the same time also indicates the living standard. As pointed out above, measuring two concepts in one variable leads to a theoretically ambiguous coefficient sign; the theory of vertically motivated FDI would suggest a negative sign, while the theory of horizontally motivated would suggest a positive sign.

VII.   Actual Data

Data for the estimation of the regression consists of annual data over the period 1984 (the first year with significant FDI inflows) to 2003 (the latest available year). Rather than forming a panel data set, however, I average the annual observations for the periods 1984 to1991 and 1992 to 2003 and examine the data cross-sectionally. I decide to split the data at this point because in 1990 China implemented a series of policies that strengthened the institutional environment for FDI. The subsequent steep increase in FDI inflows is illustrated in Graph 1 above. Total annual inflows first significantly increase in 1992, suggesting that there is a certain lag between a policy change and the adaptation to this change.[18] Thus, I choose 1992 as the split date rather than 1990.

The cross-sectional approach allows me to examine how the explanatory power of ethnic Chinese networks for FDI inflows into China evolves over time. Furthermore, it has been argued that averaged annual FDI inflow data is a more appropriate measure of inflows than annual inflows as the latter can be quite volatile since the desired level of FDI for a given year may not be realized in that year due to physical or procedural constraints (Singh and Jun, 1995). I also divide the period 1992-2003 into the sub-periods 1992 to 1997 and 1998 to 2003 to examine the most recent trends in the explanatory power of ethnic Chinese networks on bilateral FDI inflows. This split is partly informed by China´s bid for WTO membership. As discussed earlier, because of its bid China needed to start formalizing rules, including in area relevant to FDI inflows. The sample includes FDI inflows into China by the 61 source countries for which Chinese

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[18] Please refer back to the section on the Background on the Evolution of FDI Inflows into China for more details.

population figures are available for around 1990 and 2000. See Appendix A for a list of the countries included in the sample.

Poston, Mao and Yu (1994) provide information about the overseas Chinese population across countries for around 1990. For around 2000, the information was generously provided by Poston (private correspondence). To arrive at the share of ethnic Chinese in the source country population these numbers are divided by the total source country population. This information is obtained from the International Monetary's International Financial Statistics Database (CD-ROM October 2005).

Data on annual FDI inflows in USD into China by source country are taken from Gao (2003) for the years 1984-1997 and from the Chinese Statisical Yearbook (various years) for the years 1998-2003. FDI inflows are inflated or deflated into constant 2000 USD using the US GDP deflator found in the International Monetary's International Financial Statistics Database (CD-ROM October 2005).

Data on GDP and GDP per capita in constant 2000 USD are obtained from the World Bank's World Development Indicators Online (<http://www.worldbank.org>) except for Taiwan.[19] Data on Taiwanese GDP and GDP per capita data comes from DB Research Key Economic Indicators (<http://www.dbresearch.com>).

Information on the distance between a source country and China and whether the source country's language is also Chinese comes from Jon Haveman's International Trade Data website, currently maintained by Raymond Robertson at Macalester College (<http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html>).

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[19] Taiwan is not an officially recognized country in the international community. Therefore, the World Bank does not provide data on Taiwan.

VIII. Results

Table 1 reports my regression results. I first estimate my basic regression for the period 1984 to 1991 (regression (1.1)) and for the period 1992 to 2003 (regression (2.1)). The fit of around 0.7 for both regressions is in the magnitude of Gao's (2003) and Carr, Markusen, and Maskus' (2001) estimation of the knowledge capital model. Note that period 1984 to 1991 has only 34 instead of 61 observations. This is because the 27 countries that had no FDI inflows during this period are dropped by the log transformation. All control variables in the basic regression equation are significant at the one percent level except distance in the period 1984 to 1991, which is significant at the 5 percent level, and GDP Difference Squared, which is insignificant.

GDP Sum has the expected positive sign and is significant providing evidence that FDI investment into China is horizontally motivated. Because of the log-log relationship between FDI inflows and GDP Sum the coefficient is the elasticity of FDI with respect to GPD Sum. A one percentage point increase in GDP Sum causes a 2.2% (2.6%) increase in annual FDI inflows in 1984 to 1991 (1992 to 2003). The variable GDP Difference Squared, on the other hand, is not significant though it has the theorized negative sign in (1.1). Thus, the hypothesis that similarity in total GDP increases FDI inflows cannot be confirmed in this model. The difference in GDP per capita is significantly positively

[Insert Table 1 here]

correlated to FDI inflows. This shows that even at the per capita level, which as mentioned might be a better measurement of similarity between source country and China, similarity does not increase FDI inflows as the horizontal FDI model would predict. Rather, the positive sign is consistent with the prediction of the vertical FDI model. In both periods the elasticity is approximately 0.5. The coefficient on distance is negative, in line with the theory on vertically motivated FDI. The elasticity is -1.7 in the earlier and -1.3 in the later period. Note that the coefficient estimate decreases. That could indicate that as transport costs have decreased over time they figure less in the location choice of a firm.

The ethnic Chinese variable is positive as expected and significant at the one percent level. For the period 1984 to 1991 FDI inflows increase by 4.6 percent when the population share of the ethnic Chinese in the source country increases by one percentage point, while for the period 1992 to 2003 FDI inflows increase by 5.5 percent. The magnitude of the coefficients is in line with the findings of Gao (2003) and suggests that ethnic Chinese networks do indeed have an economically sizeable impact on FDI inflows into China. Contrary to my hypothesis that the role of ethnic Chinese networks decreases as formal institutions strengthen, the coefficient on the variable increases though they may not be statistically significantly different. If they are, however, this is somewhat surprising. A possible explanation might be that the implemented reforms did not go far enough to actually induce the hypothesized substitution effect and that the difference in the coefficient estimate is just a variation around some mean rather than a decrease. The

only effect of the reforms then might have been to increase overall levels of FDI inflows as illustrated in Graph 1 above.

In the following two regressions for each period dummy variables are added to examine whether the Chinese network variable picks up cultural 'closeness' rather than the network effect. In regression (1.2) and (2.2) a dummy variable is introduced to indicate whether the source country is located in Southeast or East Asia. The rationale for including this dummy variable is that firms from those source countries may share some common way of conducting business due to cultural similarities that may increase FDI investment in that region (Gao, 2003). The sign on the coefficient of the dummy variable is as expected positive, however, only in the period 1992 to 2003 significant. The ethnic Chinese variable remains significant but its coefficient drops from 4.59 to 4.27 (1984 to 1991) and from 5.09 to 3.16 (1992 to 2003). Note that the distance variable looses it significance in both periods. Thus, the distance variable might not actually represent trade costs but cultural distance in conducting business. The fit for (2.2) slightly increases compared to the fit in (2.1).

A language dummy in addition to the regional dummy is added in a further modification of the basic equation. The language dummy takes on the value of one if Chinese is the primary language in the source country. A common language might make it considerably easier to conduct business abroad and should thus increase FDI inflows from those source countries. Note that only Hong Kong and Macao and Taiwan have Chinese as their primary language. The language dummy is insignificant both periods, although it has the right sign in (1.3). The coefficient of the regional dummy remains

positive but turns insignificant in both periods. The ethnic Chinese variable remains positive, however its coefficient loses its significance in the earlier period while it remains significant in the later one and even increases to 5.25, higher than in either (2.1) or (2.2). Similarly to (1.2) and (2.2), the other control variables remain significant with the exception of the distance variable. It is not clear that the inclusion of the dummies improves the model. An F-test between (1.3) and (1.1) indicates that the null hypothesis that the added dummies are equal to zero cannot be rejected. The same test between (2.3) and (2.1), however, does reject the null hypothesis.

Especially in the last ten years, China has implemented a series of significant legal, economic, and political reforms. To examine how the explanatory power of ethnic Chinese networks evolved most recently I divide the later period into the two sub-periods, 1992 to 1997 and 1998 to 2003. The results generally reflect the findings for the entire period. The coefficients on the variables GDP Sum and Per Capita GDP Difference are positive and significant at the one percent level while the variable GDP Difference Squared is insignificant throughout all specifications for both sub-periods. Distance is only significant in the basic regression of the earlier sub-period but not in the later one. If distance really measures cultural distance rather than trade costs as speculated above then this is puzzling. To the degree that distance does increase trade costs, a possible explanation might be that trade costs have fallen to such a degree as to be insignificant. Alternatively, however, this could also mean that cultural difference is becoming less important.

The coefficient on the Chinese network variable continues to be significant at the one percent level. This time the coefficient in the earlier sub-period is higher than in the later one as hypothesized. A one percentage point increase in the share of the Chinese population in the source country increases FDI inflows into China by 5.9 percent and 5.3 percent, respectively. This provides some evidence that the role of Chinese networks decreases as institutional reforms are implemented. However, in so far as the increase between the period 1984 to 1991 and 1992 to 2003 could be just a variation around a mean, the decrease could also just be a variation around a mean rather than a true decrease. The fit of the regressions slightly decrease for the sub-periods compared to the overall period 1992-2003.

The inclusion of the dummies in (3.2) and (3.3) and (4.2) and (4.3) again yields similar results to those of the entire period. Note that once the dummy variables are added, the coefficient on the Chinese network variable is greater in the later sub-period. However, it is not clear that the inclusion of the dummies actually adds to the model as the differences in significance indicate. An F-test between (3.3) and (3.1) rejects the null hypothesis that the added dummies are equal to zero. The same test between (4.3) and (4.1), however, indicated that the null hypothesis cannot be rejected.

IX.   Conclusion

The role of ethnic Chinese networks in promoting FDI inflows into China in the presence of a weak institutional environment has recently received increasing attention.

While researchers stress the importance of ethnic Chinese networks in promoting FDI inflows into China, they also stress that they expect the role of networks to decrease as formal institutions strengthen (see for example Fu, 2000 and Wang, 2001). My analysis suggests that even though formal institutions in China have strengthened, it is not clear whether the role of ethnic Chinese networks in promoting FDI inflows has diminished. My results over the entire period suggest that, if anything, the role of ethnic Chinese networks has increased. This seemingly contradicts the assertion that strengthening formal institutions are a substitute for social networks in general and ethnic Chinese networks in particular. Analyzing the period from 1992 to 2003, however, suggests that the role of the Chinese networks, if anything, does indeed decrease. A possible explanation for this observation might be that formal institutions must be strengthened beyond some threshold level before a substitution effect takes place. The results for the 1992 to 2003 sub-periods suggest that this threshold level might have been reached in the late 1990s/ early 2000s.

The "infancy" of the literature on the theoretical determinants of FDI clearly poses limitations on isolating the effect ethnic Chinese networks have on FDI inflows into China. While the employed model seems to be the theoretically most informed at this time, the future models might prove more appropriate for disentangling the effect.

Thus, future research might re-visit the topic once researchers are better equipped to isolate the effect that social networks in general and the ethnic Chinese network in particular has on FDI inflows. The results of the sub-periods of 1992-2003 suggests that it might also be worthwhile for researchers to re-examine the topic once more time has passed and further legal, economic and political reforms are implemented. Lastly, a final

suggestion for future research is to approach this topic from a case-study perspective since it might be able to point to details that get lost in an aggregate analysis such as this one. While there are case studies that look at the influence of ethnic Chinese networks in a cross-sectional manner, it might be interesting to extend the case study approach to a panel approach to examine the effect of ethnic Chinese networks over time.

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Appendix A: List of countries in sample

Argentina	Hungary	Panama
Australia	India	Paraguay
Austria	Indonesia	Peru
Belgium	Iran	Philippines
Bolivia	Ireland	Poland
Brazil	Italy	Portugal
Canada	Jamaica	Saudi Arabia
Chile	Japan	Singapore
Colombia	Korea	South Africa
Costa Rica	Laos	Spain
Denmark	Luxembourg	Sweden
Domenican Republic	Madagascar	Switzerland
Ecuador	Malaysia	Taiwan
Egypt	Mauritius	Thailand
Fiji	Mexico	Turkey
Finland	Netherlands	United Kingdom
France	New Zealand	United States
Germany	Nicaragua	Uruguay
Greece	Nigeria	Venezuela
Guatemala	Norway	
Hong Kong and Macao[a]	Pakistan	

[a] Hong Kong and Macao are treated as one entity because FDI inflow data are only jointly available for Hong Kong and Macao up to 1997.