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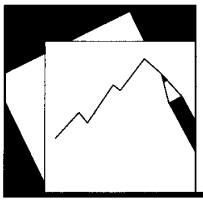

IMF Working Paper

The External Impact of China's Exchange Rate Policy: Evidence from Firm Level Data

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The External Impact of China's Exchange Rate Policy: Evidence from Firm Level Data

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Abstract

We examine the impact of renminbi revaluation on foreign firm valuations, considering two surprise announcements of changes in China's exchange rate policy in 2005 and 2010 and employing data on some 6,000 firms in 44 economies. Stock returns rise with renminbi revaluation expectations. This reaction appears to reflect a combination of improvements in general market sentiment and specific trade effects. Expected renminbi appreciation has a positive effect on firms exporting to China but a negative impact on those providing inputs for the country's processing exports. Stock prices rise for firms competing with China in their home market but fall for firms importing Chinese products with large imported-input content. There is also some evidence that expected renminbi appreciation reduces the valuation of financially-constrained firms, presumably because appreciation implies reduced Chinese purchases of foreign securities. The results carry over when we consider ten instances of market-perceived changes in prospective Chinese currency policy.

JEL Classification Numbers: F3; F4; G1

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I. INTRODUCTION

The effects of China's exchange rate are a prominent topic in both policy debate and analytical discussion. In policy circles, the questions include whether China should allow its currency to appreciate to encourage global rebalancing – that is, to shift the composition of activity away from exports and facilitate the efforts of deficit countries like the United States to export more.[2] They include whether a change in Chinese currency policy would have a significant impact on growth of U.S. output and employment.[3]

In analytical discussions, the questions include how a change in Chinese exchange rate policy would affect different sectors and activities in other countries. China exports a wide range of final goods. Foreign firms competing with Chinese exporters of these products should therefore feel positive effects from a change in policy that signals greater Chinese willingness to allow the renminbi to appreciate. Similarly, China is increasingly important as a source of parts and components for manufacturing in other countries. Firms relying on these inputs will therefore be adversely affected by renminbi appreciation that makes those inputs more expensive. Some investigators focusing on the United States conclude that this channel has grown to the point where the impact of renminbi appreciation on U.S. firms would be negative on balance.[4]

Foreign producers exporting final goods to China, for their part, would benefit from renminbi appreciation that increases the purchasing power of Chinese firms and households. Insofar as currency appreciation is accompanied by other measures designed to stimulate domestic spending, the benefit to countries exporting final goods to China would be greater still. China is also a source of demand for parts and components produced in Asia and elsewhere.[5] While renminbi appreciation would increase China's command over these products, it might also signal a shift away from the export-oriented assembly operations that have been a source of this demand.[6]

Finally, China is an important purchaser of foreign assets and an influence on foreign financial conditions. Its purchases of U.S. treasury securities are a concomitant of its exchange rate regime; they are required to prevent the renminbi from rising more rapidly against the dollar. Greater willingness to allow the renminbi to rise might imply fewer Chinese purchases and, in turn, higher foreign yields (e.g. Bernanke 2005, Bernanke et al 2011). This could affect the cost of funding for foreign corporations insofar as that cost is

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[2] For competing perspectives, see Eichengreen (2007), Dooley et al. (2009), Hanson and Robertson (2010), and Blanchard and Milesi-Ferretti (2011).

[3] For competing perspectives see Scott (2010) and Evenett and Francois (2010).

[4] As documented in the U.S. case by Evenett and Francois (2010) and, in more detail, by Francois (2010).

[5] Based on Chinese trade statistics, 45.7 per cent of China's imports in 2006 were used for so-called processing exports (35.7 per cent being intermediate inputs and 10 per cent being capital-goods imports).

[6] Garcia-Herrero and Koivu (2008) estimate that a ten per cent rise in the renminbi would reduce China's imports of components by as much as 6 per cent. Ahmed (2009) also find that renminbi appreciation could cause both China's processing and non-processing exports to go down, by examining the latest data till 2009. His finding reinforces the conclusions of some earlier studies, such as Marquez and Schindler (2006), which found that Chinese exports respond strongly to movements in the real exchange rate.

linked to conditions in treasury markets. Foreign firms that depend most on external finance would presumably be hit hardest.

These effects could then be tempered or reinforced by the foreign response to changes in China's currency policy. Indications that China is prepared to allow its currency to appreciate would reduce the risk of trade sanctions by countries that have strongly advocated renminbi revaluation, positively affecting foreign firms that benefit from trade with the country. The currencies of other emerging markets might appreciate along with the renminbi, something that would have further implications for foreign firms and their competitors.[7]

In this paper we test for the importance of these channels through which a change in Chinese exchange rate policy potentially impacts firms in other countries. We ask how announcements by the People's Bank of China (PBOC) on July 21st, 2005 and June 19th, 2010, both of which gave rise to greater expectations of currency appreciation, affected the market valuation of foreign firms. These two events were driven more by political factors than concurrent macroeconomic news in China, with the timing and the extent being a surprise to the market.[8] This provides us with a way of dealing with the endogeneity problem that plagues studies of the impact of exchange-rate announcements on financial variables.

Since we have only two PBOC announcements, we also consider a set of politically-driven changes in prospective Chinese exchange rate policy as perceived by the markets. We identify large movements in renminbi non-deliverable forward contracts (RMB NDFs) and use media coverage to distinguish movements driven by political factors rather than macroeconomic news.[9] We obtain 10 dates of expectations of politically-driven RMB NDF appreciation using this approach.

By focusing on these politically-driven events, we aim to address a basic challenge in the empirical literature on exchange rates, i.e., the difficulty of separating the impact of exchange rate changes on other macroeconomic variables from causality running in the opposite direction. As Engel (2009) writes of the exchange-rate-trade-balance nexus, "…it is very difficult to assess the effect of exchange rates on trade balances. There are few if any cases of "exogenous" changes in the exchange rate…Instead, any comovements between exchange rates and trade quantities are confounded by the forces that cause the exchange rate

[7] It is worth mentioning that we focus on the exchange rate angle. As the currency may be only one part of the global rebalancing, our exercise is therefore narrowly defined and examining just one piece of the global rebalancing.

[8] At the time of both announcements, there was little indication of inflation accelerating to unacceptably high levels or of irrational exuberance in asset markets. In the second case, Chinese inflation did eventually accelerate, but considerably later (in early 2011).

[9] Such as new data on trade balance. For example, on Nov 23, 2007 (Friday), there was a large appreciation of RMB Forward due to the coming Sino-Euro meeting the following week. The market expected that China might speed up its appreciation after the meeting. Meanwhile, there was no major release of macroeconomic data, such as trade surplus or inflation, in either China or the United States.

to change in the first place…But then it is hard econometrically to separate out the effect of the depreciation on the trade balance and the effect of the trade balance on the depreciation."[10] To the extent that the PBOC announcements and NDF movements we consider reflect political rather than economic factors, the problem of reverse causality flagged by Engel (2009) will not be as serious as in other contexts.

Firm-level data permit us to distinguish different channels through which Chinese currency policy affects other countries. We can distinguish firms that compete with Chinese exports of similar products from firms that export directly to China. We can distinguish exporters of parts and components from exporters of final goods. We can distinguish foreign firms according to their degree of dependence on external finance.

We find that the stock returns of non-Chinese corporations rise in response to expectations of renminbi appreciation. This response appears to be associated with both general market sentiment, which we interpret in terms of reduced risk of trade-policy conflict, and specific trade effects. There are, at the same time, pronounced differences in response across firms. A large positive effect is evident for exporters of final goods to China. Suppliers of inputs for China's processing exports, however, experienced no significant net market-valuation effects at the time of the two PBOC announcements.[11]

We find similar patterns when examining the implications of Chinese currency policy for competition in the firm's home and third markets. Firms face less competition from China after renminbi appreciation if they compete with China in home or third markets in selling final products but do not benefit significantly if they compete with China in processing trade. In addition, there is some support for the view that announcements of changes in Chinese currency policy, by causing investors to revise upward their estimates of actual and expected treasury yields, reduce the market valuation of firms that depend on external finance for funding their investment.

These patterns are still evident when we control for firm-specific characteristics and sector, year and country fixed effects. They carry over when we control for local currency movements associated with renminbi appreciation. They hold whether total stock returns or abnormal returns are used as the dependent variable. Placebo tests for similar effects on adjoining days do not find them, suggesting that these effects are not being caused by other events affecting market valuations. Finally, these patterns continue to hold when we expand our sample to ten dates of market expectations of politically-motivated changes in renminbi policy.

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[10] Earlier studies have examined how exchange rates affect equity prices (see for example Phylaktis and Ravazzolo 2005). Effects for individual firms vary in expected way by exposures to exchange rates (firm size, multinational status, foreign sales, international assets, competitiveness and so forth; see Griffin and Stulz 2001, and Dominguez and Tesar, 2006).

[11] Possibly, the positive income effect of renminbi appreciation is offset by the negative effect from reduced derived demand for processing inputs. Other recent work also finds a negative long-term impact of renminbi appreciation on China's imports, plausibly reflecting this imported-input effect. For example Marquez and Schindler (2006), and Cheung, Chinn and Fujii (2010), using aggregate country-level data, find that Chinese ordinary imports rise in response to renminbi depreciation.

We describe our data and methodology in Section 2. Section 3 presents results for the two PBOC announcements. Section 4 reports robustness checks. Section 5 extends the sample to 10 dates of market expectations of politically-motivated changes in Chinese exchange rate policy. Section 6 then concludes.

II. DATA AND METHODOLOGY

Our basic specification is of the form:

$$(1)\quad \text{Stock Return}_{ijkt} = \beta \text{Trade Channels}_{jkt} + \gamma \text{Financial Channel}_{jkt} + \lambda \text{Controls}_{ijkt} + \varepsilon_{ijkt}$$

Here *"Stock Return"* is the one-day return for firm i in sector j in country k at time t. *"Trade Channel"* encompasses three trade-related effects of China's exchange rate announcements: the impact on exports to China, the impact on imports from China, and the impact on competition with China in third markets. Trade data are collected from the UN Comtrade data set, which provides information on bilateral imports and exports for each country pair at the 4-digit US SIC level.

The problem of reverse causality running from stock prices to exchange rate policy should not be as serious here as in other studies of the connections between exchange rates and related variables, since our stock price variable is highly disaggregated while the exchange rate is a macroeconomic variable. (In other words, movements in individual share prices are unlikely to affect an economy-wide aggregate like the exchange rate.) Nonetheless, to further address the possibility of reverse causality, we lag the trade data, using 2004 observations for the 2005 announcement and 2008 observations for the 2010 announcement, respectively.[12] We also focus on episodes where expectations of changes in the exchange rate arise from political as opposed to economic developments, as further explained below.

In practice we distinguish the importance for these various classes of firms of (a) China's own market, as captured by exports to China by sector j of country k divided by global exports of sector j of country k, (b) the impact on home-market competition, as captured by imports from China by sector j in country k divided by total imports of sector j in country k, and (c) Chinese competition in third markets, as captured by China's global exports of sector j divided by the World's total exports of sector j, calculated separately for each year. [13] Note that we limit our attention to manufacturing, i.e., sectors with a 4-digit U.S. SIC code between 2000 and 4000.

[12] 2009 data would be contaminated by the effects of the financial crisis.
[13] The second and third of these variables are constructed following Forbes (2004). For sectors with no export data, these trade channels are assigned a value of zero.

Hence the trade channel in equation (1) now becomes:

$$(2)\quad \begin{aligned}&\beta(\text{Trade Channels}_{jkt})\\ &= \beta_1(\text{Exports to China})_{jkt} + \beta_2(\text{Imports from China})_{jkt} + \beta_3(\text{Third-market Competition})_{jt}\end{aligned}$$

We compute stock returns as follows. For the July 21st, 2005 announcement (Thursday, 4 p.m. Shanghai time), we take the log change in the closing price between July 21th and July 22nd for Asian firms. For firms in other countries we take the log difference in the closing price between July 20th and July 21st so as to control for time-zone effects. For the June 19th, 2010 announcement, which occurred on a Saturday, we take the log difference between closing prices on June 18th and 21st. Stock prices are from Datastream.[14]

Table 1 shows the number of listed manufacturing firms by country for the two announcements. We consider all countries other than China for which data on at least five firms are available (44 economies in all).

Table 2 shows market returns and exchange rate movements around these two announcements. Firms in three fourths of our sample countries experienced a rise in stock prices with an average stock market return of 0.6% and a standard deviation of 1%. Interestingly, the U.S. stock market return is negative around the time of both announcements (-0.69% in 2005, and -0.39% in 2010). Whether these heterogeneous responses are due to idiosyncratic shocks or systematic factors is to be determined.

Some currencies, particularly in Asia, appreciated together with the renminbi around the time of the two announcements (again see Table 2). This suggests another channel through which renminbi announcements can affect foreign stock markets: by affecting other exchange rates.[15]

Figure 1 juxtaposes stock market returns and trade with China for different countries. The top two charts consider exports to China over total exports around the time of the two PBOC announcements. It is hard to detect a significant association between the stock market reaction and total exports to China. The bottom two charts consider imports from China over total imports, again for the two PBOC announcements. Once more it is hard to discern a simple correlation.[16]

However, the absence of an obvious correlation could result from the presence of different factors working in opposite directions and affecting different firms differentially. While foreign firms exporting final products to China should benefit from the additional demand that comes with appreciation, foreign firms exporting components to China for processing trade could suffer due to the decline in demand for China's final exports.

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[14] In robustness checks, we will also study abnormal stock market returns (see below).
[15] We will consider this as well in the analysis.
[16] The association between the stock market reaction and import exposure to China was actually negative in 2005.

Similarly, firms relying Chinese products as inputs into their own production, including the parent companies of Chinese subsidiaries and other upstream companies that are part of the same global supply chain, may find their costs increased by renminbi appreciation.

To control for these factors we extend the analysis of trade effects as follows:

$$\begin{aligned}\beta\text{Trade Channels}_{jkt} &= (\beta_{11} + \beta_{12}\text{China's Processing Imports}_j) * (\text{Exports to China})_{jkt} \\ &+ (\beta_{21} + \beta_{22}\text{China's Processing Exports}_j) * (\text{Imports from China})_{jkt} \\ &+ \beta_3(\text{Third-market Competition})_{jt}\end{aligned} \tag{3}$$

where the expectation is that $\beta_{12} < 0$. That is, firms supplying inputs to China for that country's processing trade will experience stock-price declines. We similarly expect $\beta_{22} < 0$, since firms importing inputs from China will experience higher costs as well.

Data for China's processing trade are from Koopman, Wang and Wei (2008), who use the UN BEC classification and processing-trade information from China Customs Trade Statistics to identify the use for imports of some 60 manufacturing sectors in China in 2002.[17] The authors estimate the shares of intermediates for processing exports, intermediates for normal use, capital goods for normal use, capital goods for processing exports, and final consumption goods.[18] They then use China's 2002 input-output table to calculate the percentage of processing exports in China's exports, by industry.[19]

"Financial Channel" is designed to capture the impact of renminbi appreciation expectations on corporate funding costs, for firms that depend on external finance in particular, insofar as renminbi appreciation is expected to imply reduced Chinese purchases of U.S. treasury securities and put upward pressure on yields more generally. We construct a sector-level approximation of a firm's intrinsic dependence on external finance for capital investment following the methodology of Rajan and Zingales (1998):

$$\text{Dependence on external finance for investment} = \frac{\text{capital expenditures - cash flow}}{\text{capital expenditures}}, \tag{4}$$

where "cash flow" denotes cash flow from operations plus reductions in inventories plus decreases in receivables plus increases in payables. Conceptually, the Rajan-Zingales (RZ)

[17] China's Customs Trade Statistics classifies imports to China as for processing trade or for normal usage. See also Koopman, Powers, Wang, and Wei (2010) for more details.

[18] Sectors with large share of intermediates for processing exports include, for example electronic element and device, and plastic products, while sectors with small share of intermediates for processing exports include chemical fertilizers and medical products.

[19] The sectors identified with large processing exports include for example electronic and communication equipment and household electric appliances, while sectors with small processing exports include chemical pesticides and cement, lime and plaster.

index aims to identify sectors that are naturally more dependent on external financing for their investment and other business operations.[20]

Following standard practice, the RZ index is calculated using data for U.S. firms, which are assumed to be least likely to suffer from financing constraints of a sort likely to disguise their underlying reliance on external finance. While the original Rajan and Zingales (1998) paper covers 40 (mainly SIC 2-digit) sectors, we expand the coverage to 110 SIC 3-digit sectors. To calculate the dependence external financing of U.S. firms, we first sort all firms listed in COMPUSTA USA into SIC 3-digit sectors. We then calculate the external-finance-dependence ratio (eqn. 4) for each firm on average for the period 1990-2006. Finally we take the sector-level median from firm ratios for each SIC 3-digit sector with at least 5 firms as the index of demand for external finance by firms in that sector. To capture the percentage of capital expenditure financed externally, we winsorize our version of the RZ index so that it ranges from 0 to 1.

Asset pricing models provide guidance for control variables. We add the three factors from Fama and French (1992): firm size (log assets), the ratio of the market value to book value, and the beta (the correlation between the firm's weekly stock return and the market return).[21] These control variables are lagged one year when included in our estimating equation. Table 3 provides summary statistics for the dependent variables and explanatory variables.

Throughout we cluster the standard errors by sector.[22]

III. RESULTS FOR THE TWO PBOC ANNOUNCEMENTS

Table 4 presents benchmark estimates for firms exporting to China. The first column shows that, on average, firms exporting to China benefit from RMB appreciation, although the coefficient in question is insignificantly different from zero at standard confidence levels. The absence of a strong correlation is consistent with Figure 1 above. In Column 2 we therefore add the interaction of *China's Processing Imports* and *Exports to China*, as in equation (3), including also its individual constituents as controls. *Exports to China* now has a significant positive coefficient, suggesting that firms selling final products to China experience a positive stock return. In addition, the interaction term has a negative coefficient which differs significantly from zero at the 5% level. Evidently, the positive impact otherwise felt by firms exporting to China is smaller for sectors where China imports products for use in the production of processing exports.

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[20] In so doing it ignores the question of which firms within a sector are more liquidity constrained. What the RZ index measures could be regarded as a technical or technological characteristic of the sector, almost like a part of the production function.

[21] We follow Whited and Wu (2006) by entering the relevant firm characteristics directly into our regressions rather than by first going through a factor model. For control variables, these two ways of incorporating the three factors should be equivalent. Entering firm characteristics directly into our regressions is easier to implement, though the interpretation of the coefficients on these factors is less straightforward.

[22] It turns out that we get very similar results when clustering at the country-sector level.

In Column 3, we add a dummy variable that equals one if the sector has an above-median value for *China's Processing Imports* (i.e, >=0.16). This should help to control for measurement error in the index of *China's Processing Imports*. We interact this dummy with *Exports to China*. Again the coefficient on the interaction term is negative and significant. Its point estimate is -1.98, while the point estimate of *Exports to China* is 1.80 (both are significant at the 1% level). Hence while the net effect for firms exporting to China in sectors with below-median processing inputs is large and positive (1.80), that effect is small and even negative (-0.18) for firms in the above-median sectors.

Other factors besides firms' exports to China may of course affect stock returns. We now add additional variables intended to capture these factors, such as three variables from the Fama-French (1992) model, which are firm size (as measured by the log of book assets in US dollar), the book-asset-to-market-asset ratio, and the firm's market beta, information on which we draw from Worldscope and Datastream. beta is constructed as the correlation between weekly firm stock return and the country-level market return over the past year.[23]

Adding these controls in Column 4 reduces the magnitude of the interaction of *China's Processing Imports* and *Exports to China*, suggesting that *Exports to China* is correlated with firm-level risk factors captured by Fama-French factors. However, the change in magnitudes is small, and the interaction term still has a coefficient of -1.5 that differs significantly from zero at the 1% level.

Now however the coefficient on *Exports to China* becomes insignificant, while the beta factor is positive and significant at the 1 per cent confidence level. The Capital Asset Pricing Model interprets beta as a measure of market risk. This raises the question of whether the observed increase in stock valuations is driven by trade-related effects or general market sentiment, where market sentiment might improve because expectations of renminbi appreciation reduce fears that the U.S. might brand China as a currency manipulator and impose trade sanctions (to which China might retaliate). Public commentary is consistent with at least some role for this second factor.[24] Improved sentiment will reduce perceived market risk and hence boost stock prices for firms with higher betas. The significance of beta, the insignificance of *Exports to China*, and the aforementioned market comments are all consistent with the hypothesis that China's exchange rate announcements boosted share prices through this sentiment effect (by, inter alia, reducing the perceived likelihood of a trade war) as well as through specific trade effects (such as creating the prospect of additional exports to China).

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[23] An alternative is to focus on abnormal returns, as we do in subsequent sections.

[24] BBC Business (6/21/2010) noted in the wake of the 2010 announcement that Chinese yuan flexibility comments buoyed markets, as "the move, ahead of the G20 summit later this month, has tempered market fears of a possible trade war between China and the U.S." Deutsche Bank Global Market Research (6/21/2010) noted that "the decline in the probability of a trade war between China and the US – as a result of China's currency move -- should help lift market sentiment for risky asset classes." AFP London (Jun 21, 2010) similarly noted that "Global equities surged on Monday after China said it would relax constraints on the yuan, in a surprise move seen by analysts as an attempt to defuse tensions before a crucial G20 summit this weekend … Investor sentiment has improved quite dramatically over the weekend, with the news that China has pledged to allow its yuan to appreciate, helping to drive all major markets higher."

In Column 5 we add fixed effects for the announcement day, the country, and the 3-digit US SIC sector. While the magnitude of the negative effect on *China's Processing Imports * Exports to China* declines slightly (logically insofar as part of its impact is now captured by fixed effects), it remains significant at the 5% level.

In Column 6, we consider a case study of processing trade by focusing on electronic components, defined as U.S. SIC Industry Group 367 (Electronic Components and Accessories). A significant portion of the trade imbalance between China and the U.S. is associated with the exports of "processing industries," in which multinational firms import intermediate goods from other countries and assemble them into finished products, and re-export them. Multinationals involved in this processing trade are responsible for more than 80 percent of the surplus between China and the U.S in an accounting sense. The export of laptops alone contributes to about half of China's surplus in processing trade.[25]

We therefore define a dummy variable to denote firms that are active in these sectors; this is set to one for 8 per cent of the firms in the sample. *Components * Exports to China* enters with a negative coefficient in Column 6, consistent with the idea that firms exporting components to China are negatively impacted by renminbi appreciation.

In Table 5 we consider competition in the firm's home market as captured by imports from China as a share of total imports. Specifically, we ask how imports from China affect stock prices. In Column 1, the coefficient in question is positive and significant at the 10% level. It would appear that expectations of renminbi appreciation boost stock prices for firms that compete with China in their home markets. In Column 2 we ask whether the results vary with the degree of processing trade in imports from China, adding $(\text{China's Processing Exports}_j)*(\text{Imports from China})_{jkt}$. Our hypothesis is that firms importing Chinese products that themselves possess high imported-input content are likely to feel negative effects insofar as they are parent companies of Chinese subsidiaries or reside upstream of China in the relevant production chain. The index of *China's Processing Exports* comes from Koopman et. al (2008), which uses China's input-output table to calculate the contribution of processing trade to final exports for 61 manufacturing sectors for year 2002.

The coefficient on $(\text{China's Processing Exports}_j)*(\text{Imports from China})_{jkt}$ is negative and significantly different from zero at standard confidence levels, indicating that expectations of renminbi appreciation depress stock returns for firms importing products from China with high processing content. In contrast, *Imports from China* is positive, suggesting that international firms, if they compete with China in final-product trade, are expected to face less competition in their home market. The point estimate for the interaction term is -1.9, while the point estimate for *Imports from China* is 0.79. Given that the median ratio of $\text{China's Processing Exports}_j$ is 0.43, this means that about half of all sectors

[25] 95 percent of laptops worldwide being assembled in China. See "Processing Industry at Root of Trade Imbalance," *China Daily* (1/6/2011).

experience a decline in stock prices as a result of expectations operating through this home market channel.

In Column 3, we again add as controls the firm's beta multiplied by the market return, the firm's size, and the firm's book-to-market ratio. The magnitude of the coefficient on $(\text{China's Processing Exports}_j)*(\text{Imports from China})_{jkt}$ now falls slightly, but its statistical significance is now higher (the coefficient in question now differs from zero at the 1% confidence level). In Column 4, we add county, date and 3-digit sector dummies. The coefficient on the interaction term is again somewhat reduced in magnitude but remains significant at the 5% confidence level.

In Table 6 we focus on third-market competition. In Column 1, we include third-market competition together with firm-level controls and country and year fixed effects. Third-market competition enters with a negative coefficient of -0.22 but does not differ significantly from zero at standard confidence levels. [26]

In Column 2 we add the interaction between *Third-Market Competition* and *China's Processing Exports*. The new term enters with a negative coefficient that differs significantly from zero at the 5% confidence level. It would appear expectations of renminbi appreciation depress stock returns for firms competing with China in third markets in products with high processing content. However, *Third Market Competition* entered in levels is positive, suggesting that international firms, if they compete in final-goods trade with China in third markets, are expected to face less competition following renminbi appreciation.

In Column 3, we add proxies for *Imports from China* and *Exports to China*. In their presence, the interaction between *Third-market Competition* and *China's Processing Exports* is still negative, albeit insignificant. Reassuringly, however, the key results in earlier tables on *Imports from China* and *Exports to China* continue to hold.

In Column 4 we consider the possibility that expectations of renminbi appreciation put upward pressure on treasury yields, making it more expensive for financially-dependent firms to fund their investments. U.S. Treasury bond yields in fact rose on both announcement dates, consistent with the idea that faster renminbi appreciation would mean fewer PBOC purchases of U.S. Treasury bonds. The question is whether this had a differential impact on more financially dependent firms. As Column 4 shows, financially dependent firms saw their share prices decline with both two announcements of prospective changes in China's exchange rate regime, consistent with the hypothesis. The results for the financial channel

[26] We excluded sector fixed effects because that third-market competition is highly correlated with sector fixed effects. It is currently captured by China's global exports of sector j divided by the World's total exports of sector j, calculated separately for each year. There is no variation across countries, although with some time variation. The variable is different from "*Exports to China"* and *"Home market competition"* (The latter two channels have country variations).

remain also the same if we add proxies for trade channels, as in Column 5. The coefficients on the financial dependence measure differ significantly from zero at the 1% confidence level.

IV. ROBUSTNESS CHECKS

So far we have shown that the pattern of stock returns across firms is consistent with the global-production-chain story. We now consider alternative explanations, such as the possibility that countries exporting more to China experience faster appreciation of their own currencies. It is widely argued, for example, that neighboring Asian countries that trade heavily with China are reluctant to allow their currencies to rise for fear of losing market share there or in their home markets, fears that should be attenuated if the renminbi is itself allowed to rise against extra-regional currencies.

To capture this possibility we add two interaction terms: *Local Currency Appreciation * Exports to China*, and *RMB Appreciation * Exports to China*.[27] While the preceding logic suggests that local currency appreciation is likely to be endogenous with respect to renminbi appreciation, the level of the exchange rate is a country-level variable beyond the influence of individual firms. Hence it should still provide some insight into the question at hand.

In Column 1 of Table 7, *RMB Appreciation*(Exports to China)* has a significant positive coefficient, while *Local Currency Appreciation*(Exports to China)* has a significant negative coefficient. Both signs accord with the preceding intuition. Moreover, the interaction of *High Chinese Processing Imports* and *Exports to China* still has a negative coefficient (-1.47) that is statistically significant at the 1% level, consistent with earlier results.[28] In Column 2, we add country, date and sector fixed effects. In this case *Local Currency Appreciation * Exports to China* is no longer significant, while $(\text{China's Processing Exports}_j)*(\text{Imports from China})_{jkt}$ remains significant at the 5% level. Reassuringly, the previous results continue to hold for the interaction of *China's Processing Imports* with *Exports to China*.

In Columns 3 and 4 we focus on competition in the home market. Again we find that *(RMB appreciation * Imports from China* has a significant positive coefficient, while *Local Currency Appreciation * Imports from China* has a significant negative coefficient, again consistent with preceding intuition. Reassuringly, the interaction of *Imports from China* with *Chinese Processing Exports* remains significant at the 1% level. The point estimate (of -1.87) is similar to that in Table 3 (-1.75). In Column 4, where we add country, year and sector effects, the results carry over.

[27] In a sense we have already provided for this possibility by including country fixed effects and the interaction of beta and market return. But the two new variables should capture this effect more directly.
[28] The interaction term in question took on a value of -1.50 in Table 3.

Evidently, then, allowing for the asymmetric response of local currencies leaves our interpretation in terms of global supply chains unaffected.

Abnormal returns have also been studied as a measure of the impact of macroeconomic shocks (by e.g, Mackinlay 1997). A common model of normal returns assumes a stable linear relation between the market return and the individual security return:

$$(5) \qquad Abnormal\ return_{i,t} = Stock\ return_{i,t} - Alpha_{i,t} - Beta_{i,t} * Market\ return_{k,t}$$

We construct each firm's beta annually based on the correlation of weekly firm-level stock returns and local market returns.[29] We then construct each firm's alpha as the annual average of its weekly average return minus the beta multiplied by the annual average market return. We use the one-year-lagged beta and alpha in constructing the abnormal return around the two renminbi appreciation dates.[30] We winsorize the dependent variable at the 1% level to reduce the influence of outliers.

The results using abnormal returns are in Table 8 for exports to China and Table 9 for imports from China. They confirm the findings in Tables 4 and 5. In Column 1 of Table 8, we find that firms exporting to China experience a decline in their abnormal stock returns around the time of the two reminbi appreciation announcements. While this finding is surprising, it is consistent with the findings in Cheung, Chinn and Fujii (2010), where renminbi appreciation reduces China's imports. In Column 2, we include the interaction of *Exports to China* with *China's Processing Imports*. This interaction term also has a negative coefficient that differs significantly from zero at the 1% confidence level. However, the coefficient for *Exports to China* in levels is no longer significant, suggesting that the negative coefficient in Column 1 is driven mainly by firms exporting processing inputs to China. In Column 3, we therefore replace *China's Processing Imports* with a dummy variable indicating *High Chinese Processing Imports* as in Table 4. Again, the interaction term has a negative coefficient that differs from zero at the 1% level. In Column 4, where we add country, year and sector fixed effects, the interaction term is reduced somewhat in magnitude but remains significant at the 10% level. In the last column, we replace *China's Processing Imports* with a dummy variable indicating components-producing industries, while keeping the fixed effects. Again, *Components * Exports to China* enters with a negative coefficient that differs significantly from zero at the 1% level.

In Table 9 we consider imports from China in a specification like that in Table 5 but now using abnormal stock returns as the dependent variable. In Column 1, *Imports from China* enters negatively but does not differ significantly from zero. In Column 2 we include the interaction of *Imports from China* with *China's Processing Exports*. This interaction

[29] We use the domestic beta rather than a beta based on a world factor model because Griffin (2002) finds that domestic factor models perform better in explaining time-series variations in returns and have lower pricing errors than the world factor model.

[30] As the alpha is constructed from weekly stock data, we use (1/5)*alpha in constructing the abnormal stock return from day t-1 to t.

enters negatively, and its coefficient differs significantly from zero at the 1% confidence level. It remains significant at the 1% level when we add country, year and sector fixed effects (Column 3). In Column 4, we add the interaction of *Exports to China* with *High China's Processing Imports*. Reassuringly, both interaction terms – the new one and that on which we focused previously – enter negatively and significantly. Hence the analysis of abnormal stock returns confirms our earlier findings based on total returns.

Finally, in a placebo test we considered daily stock returns on 7/19/2005 and 6/17/2010, i.e., two trading days before the PBOC announcements. For these two days we do not find a significant coefficient for the trade channels.[31] This reassures us that the stock-market response we detect is not reflecting other events occurring around the time of the PBOC announcements.

V. Results for Market-Perceived Policy Changes

While moving from country- to firm-level data extends the sample along one dimension – the number of responders (firms) – it does little to address the problem of limited variation along the other dimension, that as of the time of writing there have only two official announcements pointing to the prospect of future appreciation.

We address this problem by considering in addition to actual announcements sharp changes in market expectations. We focus on sharp changes in the price of nondeliverable forward (NDF) dollar-renminbi contracts that coincide with newspaper articles about possible changes in Chinese exchange rate policy owing to political factors. We identify 10 dates between 2003 and 2010 when movements in the renminbi NDF rate reacted significantly to upcoming G-7 meetings, China-US/Euro Summit meetings, or speeches by senior U.S. officials. (From 2003 to 2010, there were 48 dates when the daily change of 12 month-NDF was larger than or equal to 0.6%.) We use media coverage from Factiva to check that these NDF movements were not obviously responding to other macroeconomic news, such as new information on inflation, central bank policy rates or trade balances in China or the U.S., ruling out observations where this was the case.

Table 10 lists the 10 episodes. Daily appreciation of the 12-month renminbi NDF rate on these 10 days ranges from 0.6 per cent to 1.16 per cent, with a mean of 0.77 per cent. In the case of the two PBOC announcements, by comparison, the daily change in the 12-month NDF is 0.37 per cent and 0.98 per cent. In terms of the magnitude of the exchange rate response, then, the two types of episodes are broadly comparable.

In Column 1 of Table 11, where we examine the impact of renminbi NDF appreciation on firm valuations, the coefficient on *Components * Exports to China* is negative and differs significantly from zero at the 1% confidence level, consistent with our earlier results for the two PBOC announcements, although the point estimate is a bit smaller

[31] Results available from the authors on request.

in magnitude.[32] The results carry over when we include firm-level controls and country, year and sector dummies, as in Column 2.

In Columns 3 and 4 we examine home-market competition as captured by *Imports from China*. There $(China's\ Processing\ Exports_j)*(Imports\ from\ China)_{jkt}$ enters with a negative coefficient that differs significantly from zero at the 10% confidence level. That interaction term becomes significant at the 5% level when we include firm controls and country, year and sector dummies (Column 4).

Hence extending our sample to market-perceived policy changes confirms our earlier findings for the two actual PBOC announcements.

VI. CONCLUSIONS

We have extended existing research on the prospective impact of appreciation of the renminbi exchange rate on the rest of the world using firm-level data. We examine the response of share prices to two announcements of changes in China's currency policy in 2005 and 2010, both of which plausibly created expectations of faster renminbi appreciation, using movements in stock prices of some 6,000 manufacturing firms in 44 economies. We then consider 10 instances of market-perceived changes in exchange rate policy, as reflected in unusually large renminbi movements on the NDF market, each of which was associated with political as opposed to economic factors.

Expectations of renminbi appreciation appear to impact foreign firm valuations both through a general market-sentiment effect, which appears to reflect diminished fears of trade sanctions and retaliation, and specific trade-related channels. In terms of the trade effects, renminbi-appreciation expectations negatively impact firms selling inputs to China for its processing trade. In contrast, such expectations do not negatively impact firms selling final goods to China; if anything the effect on them is positive. There is some evidence as well that renminbi appreciation positively affects firms competing with China in home and third markets, but the effect is weaker for firms in sectors where China's exports have large imported-input content. Finally, there is evidence of a negative impact on financially-dependent firms which may find it more costly to fund their investments as a result of the upward pressure on yields resulting from reduced Chinese purchases of foreign treasury bonds.

These patterns remain when we control for firm-specific characteristics and sector, year and country fixed effects. They are still evident when we control for local currency movements associated with renminbi appreciation. They continue to hold when abnormal rather than total stock returns is used as the dependent variable. Finally, placebo tests for similar effects on adjoining days do not find them, suggesting that these stock-price responses are not being caused by other events affecting market valuations.

Overall, the message is that across-the-board inferences are misleading. The impact of renminbi appreciation, actual and prospective, on firms, sectors and countries will be very

[32] We cluster standard errors at the level of sector as before.

different depending on their circumstances and the specific nature of their interaction with China.

Table 1. Number of Listed Firms

Country	# of Firms	Country	# of Firms
ARGENTINA	17	JAPAN	1,159
AUSTRALIA	101	SOUTH KOREA	538
AUSTRIA	30	MALAYSIA	228
BELGIUM	34	MEXICO	20
BRAZIL	39	NETHERLANDS	36
CANADA	199	NEW ZEALAND	8
CHILE	17	NORWAY	27
COLOMBIA	6	PAKISTAN	40
CZECH REPUBLIC	4	PERU	11
DENMARK	35	PHILIPPINES	8
EGYPT	21	POLAND	56
FINLAND	50	PORTUGAL	11
FRANCE	163	RUSSIAN FEDERATION	19
GERMANY	207	SINGAPORE	117
GREECE	77	SOUTH AFRICA	32
HONG KONG, SAR	142	SPAIN	34
HUNGARY	8	SWEDEN	74
INDIA	529	SWITZERLAND	82
INDONESIA	47	THAILAND	118
IRELAND	10	TURKEY	79
ISRAEL	35	UNITED KINGDOM	194
ITALY	87	UNITED STATES	1,304

Note: These are listed manufacturing firms in 44 economies on July 21, 2005 and June 21, 2010.

Table 2. Stock Market Returns and Exchange Rate Movements around Two PBOC Announcements

COUNTRY	Market return 2005	Exchange rate 2005	Market return 2010	Exchange rate 2010
UNITED STATES	-0.69	0.00	-0.39	0.00
UNITED KINGDOM	0.12	0.70	0.90	-0.53
AUSTRIA	-0.57	0.10	0.85	-0.64
BELGIUM	0.61	0.10	0.79	-0.64
DENMARK	-0.05	0.09	0.97	-0.68
FRANCE	0.09	0.10	1.25	-0.64
GERMANY	0.83	0.10	1.27	-0.64
ITALY	0.02	0.10	0.27	-0.64
NETHERLANDS	0.06	0.10	1.16	-0.64
NORWAY	0.21	0.32	1.67	-1.03
SWEDEN	1.29	0.26	0.53	-0.39
SWITZERLAND	-0.26	-0.04	1.10	-0.36
CANADA	-0.15	0.33	0.13	-0.29
JAPAN	-0.64	2.22	2.07	-0.34
FINLAND	-5.78	0.10	0.22	-0.64
GREECE	0.54	0.10	3.39	-0.64
IRELAND	0.94	0.10	0.27	-0.64
PORTUGAL	0.20	0.10	0.73	-0.64
SPAIN	0.22	0.10	0.87	-0.64
TURKEY	0.95	0.47	0.56	-0.18
AUSTRALIA	0.64	1.16	1.31	0.40
NEW ZEALAND	0.38	1.08	1.32	0.03
SOUTH AFRICA	-0.25	0.36	0.44	-0.07
ARGENTINA	-0.53	0.03	0.40	0.06
BRAZIL	1.10	0.50	0.81	0.55
CHILE	0.43	-0.31	-0.15	-0.45
MEXICO	-0.50	0.11	0.14	0.09
PERU	0.27	0.00	1.07	-0.67
ISRAEL	0.00	0.76	0.92	0.00
EGYPT	-0.38	-0.02	2.35	0.11
HONG KONG	1.26	0.14	2.59	0.16
INDIA	1.46	0.97	1.77	0.79
INDONESIA	1.89	0.50	0.39	0.84
KOREA (SOUTH)	-0.55	0.82	1.64	2.48
MALAYSIA	1.86	0.00	1.23	2.03
PAKISTAN	-0.48	0.05	0.52	0.04
PHILIPPINES	-0.66	0.09	0.82	0.67
SINGAPORE	0.48	2.12	1.77	0.58
THAILAND	0.00	2.09	2.41	0.37
RUSSIAN FEDERATION	-0.64	0.35	2.66	0.40
CHINA	0.86	1.98	3.62	0.44
POLAND	-0.96	0.56	1.39	-1.03

Table 3. Summary statistics

Variables	Obs	Mean	St Dev	Med	p25	p75	Min	Max
firm-level								
Stock Return	10066	0.35	3.23	0.14	-1.05	1.69	-18.19	30.98
Beta	10045	0.81	0.70	0.74	0.35	1.16	-1.50	3.08
Firm size (log in US dollar)	10022	12.59	2.00	12.46	11.31	13.84	6.11	17.23
Book to Market ratio	9585	1.07	0.99	0.77	0.44	1.35	0.04	5.88
Country-year-sector level								
Exports to China	2314	0.04	0.09	0.01	0.00	0.04	0.00	0.44
Imports from China	2314	0.11	0.16	0.03	0.00	0.14	0.00	0.82
Third-market competition	2314	0.07	0.08	0.04	0.01	0.09	0.00	0.46
US SIC 3-digit sector-level								
China's Processing Imports	82	0.34	0.25	0.31	0.16	0.53	0.00	0.85
China's Processing Exports	81	0.38	0.24	0.43	0.20	0.51	0.00	0.99
External finance dependence	72	-0.05	0.67	-0.13	-0.27	0.03	-1.62	4.65

Note: These are for listed manufacturing firms in 44 countries on July 21, 2005 and June 21, 2010.

Table 4. Impact of PBOC announcements on stock returns: exports to China

	(1)	(2)	(3)	(4)	(5)	(6)
(Exports to China)	0.58	1.74***	1.81***	0.36	-0.28	-0.90*
	[0.45]	[0.63]	[0.60]	[0.37]	[0.55]	[0.47]
(Exports to China)*(China's processing imports)		-3.12**				
		[1.29]				
High China's processing imports*Exports to China			-1.98***	-1.50***	-1.13**	
			[0.71]	[0.48]	[0.50]	
Dummy of High China's processing imports			0.18	0.16*		
			[0.18]	[0.094]		
China's processing imports		0.21				
		[0.41]				
component sector						-0.56***
						[0.15]
component sector*(Exports to China)						-0.96***
						[0.35]
Beta*Market return				0.72***	0.56***	0.57***
				[0.040]	[0.060]	[0.060]
Firm-Size				0.075***	0.074***	0.074***
				[0.026]	[0.028]	[0.028]
Book/Market value				0.17***	0.087	0.087
				[0.045]	[0.055]	[0.056]
Constant	0.31***	0.24	0.21	-1.06***		
	[0.095]	[0.16]	[0.15]	[0.37]		
Country fixed effects	n	n	n	n	y	y
year fixed effects	n	n	n	n	y	y
sector fixed effects	n	n	n	n	y	y
Observations	10,066	10,066	10,066	9,533	9,533	9,533
R-squared	0.000	0.001	0.001	0.080	0.106	0.106

Note: Robust standard errors in brackets; *** p<0.01, ** p<0.05, * p<0.1. The sample is for two actual PBOC announcements on July 21, 2005 and June 21, 2010. The sample is for listed firms in 44 countries for the sectors of manufacturing. The trade channel is measured at the 4-digit sector level for the country where the listed firm belongs. The key variables are measured with one-year lag, except the contemporary market return. Standard errors are clustered at the level of sector.

Table 5. Impact of PBOC announcements on stock returns: imports from China

	(1)	(2)	(3)	(4)
Imports from China	0.67*	1.96***	1.00**	0.63
	[0.34]	[0.61]	[0.39]	[0.39]
Imports from China *China's processing exports		-1.83*	-1.75***	-1.13**
		[0.95]	[0.55]	[0.54]
China's processing exports		-0.39	0.080	
		[0.33]	[0.20]	
Beta*Market return			0.72***	0.57***
			[0.040]	[0.061]
Firm-Size			0.068**	0.070**
			[0.027]	[0.028]
Book/Market value			0.15***	0.084
			[0.048]	[0.055]
Constant	0.25**	0.37**	-0.94**	
	[0.099]	[0.18]	[0.41]	
country dummies	n	n	n	y
sector dummies	n	n	n	y
year dummies	n	n	n	y
Observations	10,066	9,963	9,438	9,438
R-squared	0.001	0.006	0.082	0.107

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 6. Impact of PBOC announcements on stock returns: Controlling for third-market competition and financial channel

	(1)	(2)	(3)	(4)	(5)
Third-market competition	-0.22	2.31**	0.85		0.55
	[0.50]	[1.10]	[1.12]		[1.21]
China's processing exports*Third-market competition		-4.21**	-1.87		-1.46
		[1.79]	[2.07]		[2.18]
China's processing exports		0.11	0.12		0.065
		[0.22]	[0.22]		[0.22]
Imports from China			0.86**		0.89**
			[0.41]		[0.42]
China's processing exports*Imports from China			-1.24*		-1.24*
			[0.64]		[0.64]
Exports to China			0.17**		0.14*
			[0.083]		[0.081]
High China's Processing Imports*(Exports to China)			-0.12		-0.15
			[0.42]		[0.47]
Dummy of High China's Processing Imports			-1.24***		-1.08**
			[0.46]		[0.47]
Dependence on external finance for investment				-0.073***	-0.063***
				[0.012]	[0.014]
Beta*Market return	0.57***	0.57***	0.57***	0.55***	0.56***
	[0.059]	[0.059]	[0.057]	[0.061]	[0.060]
Firm-Size	0.073**	0.068**	0.070**	0.063**	0.058**
	[0.028]	[0.029]	[0.029]	[0.026]	[0.028]
Book/Market value	0.11**	0.098*	0.092*	0.082	0.069
	[0.049]	[0.051]	[0.053]	[0.051]	[0.054]
Country fixed effects	y	y	y	y	y
Year fixed effects	y	y	y	y	y
Observations	9,533	9,438	9,438	9,246	9,151
R-squared	0.093	0.096	0.097	0.094	0.098

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 7. Impact of PBOC announcements on stock returns: Controlling for local currency appreciation

	(1)	(2)	(3)	(4)
Exports to China	-0.55	-2.04**		
	[0.69]	[1.02]		
(Exports to China)*High China's processing imports	-1.47***	-1.10**		
	[0.47]	[0.50]		
Exports to China*Yuan appreciation	1.65*	2.64**		
	[0.86]	[1.01]		
Exports to China*Local currency appreciation	-0.40*	-0.16		
	[0.24]	[0.31]		
Imports from China			0.37	-0.033
			[0.54]	[0.74]
Imports from China*China's processing exports			-1.87***	-1.25**
			[0.54]	[0.56]
Imports from China*Yuan appreciation			1.13*	1.30*
			[0.68]	[0.76]
Imports from China*Local currency appreciation			-0.30*	-0.33*
			[0.17]	[0.17]
Local currency appreciation	0.060	-0.10	0.046	-0.036
	[0.049]	[0.10]	[0.046]	[0.088]
Yuan appreciation	0.23		0.18	
	[0.23]		[0.27]	
Dummy of high China's processing imports	0.16			
	[0.096]			
China's processing exports			0.086	
			[0.21]	
Beta*Market return	0.67***	0.50***	0.67***	0.52***
	[0.036]	[0.078]	[0.037]	[0.077]
Firm-Size	0.073***	0.076***	0.065**	0.070**
	[0.027]	[0.028]	[0.028]	[0.028]
Book/Market value	0.16***	0.075	0.13***	0.065
	[0.048]	[0.055]	[0.050]	[0.056]
sector fixed effects	n	y	n	y
country fixed effects	n	y	n	y
year fixed effects	n	y	n	y
Observations	9,533	9,533	9,438	9,438
R-squared	0.082	0.107	0.084	0.108

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 8. Impact of PBOC announcements on abnormal stock returns: exporting to China

	(1)	(2)	(3)	(4)	(5)
(Exports to China)	-0.65*	-0.091	-0.034	-0.67	-1.16**
	[0.34]	[0.34]	[0.30]	[0.60]	[0.49]
(Exports to China)*(China's processing imports)		-1.97**			
		[0.80]			
(China's processing imports)		0.15			
		[0.17]			
High China's processing imports*Exports to China			-1.31***	-0.97*	
			[0.44]	[0.50]	
Dummy of high China's processing imports			0.17**		
			[0.081]		
Component sector					-0.54***
					[0.14]
Component sector*Exports to China					-1.11***
					[0.32]
Firm-Size		0.061**	0.064**	0.057**	0.058**
		[0.026]	[0.025]	[0.028]	[0.028]
Book/Market value		0.100**	0.100**	0.076	0.076
		[0.047]	[0.047]	[0.055]	[0.056]
Constant	0.015	-0.89**	-0.96***		
	[0.056]	[0.39]	[0.36]		
Country dummies, sector dummies, year dummies	n	n	n	y	y
Observations	10,011	9,532	9,532	9,532	9,532
R-squared	0.001	0.004	0.004	0.032	0.032

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 9. Impact of PBOC announcements on abnormal stock returns: Importing from China

	(1)	(2)	(3)	(4)
Imports from China	-0.089	0.97***	0.77**	0.76*
	[0.24]	[0.35]	[0.37]	[0.39]
Imports from China*China's processing exports		-2.16***	-1.57***	-1.33**
		[0.51]	[0.52]	[0.55]
China's processing exports		0.31*		
		[0.18]		
High China's processing imports* (Exports to China)				-0.90*
				[0.50]
(Exports to China/Exports to the world)				-0.66
				[0.62]
Firm-Size		0.058**	0.053*	0.053*
		[0.026]	[0.028]	[0.028]
Book/Market value		0.078	0.072	0.072
		[0.049]	[0.054]	[0.055]
Constant	-0.021	-0.95**		
	[0.062]	[0.39]		
Sector dummies, country dummies, year dummies	n	n	y	y
Observations	10,011	9,437	9,437	9,437
R-squared	0.000	0.005	0.031	0.032

Robust standard errors in brackets

Table 10: Actual or market-perceived changes in China's currency policy	
Date	12m NDF Change
6-Jan-03	0.75
22-Sep-03	0.74
23-Sep-03	1.16
3-Oct-03	0.96
16-Feb-04	0.7
5-Nov-04	0.88
22-Apr-05	0.64
29-Apr-05	0.67
21-Jul-05 (actual)	0.37
23-Nov-07	0.6
10-Jun-10	0.62
21-Jun-10 (actual)	0.98

Table 11. Impact of Market-Perceived Policy Changes on Stock Returns

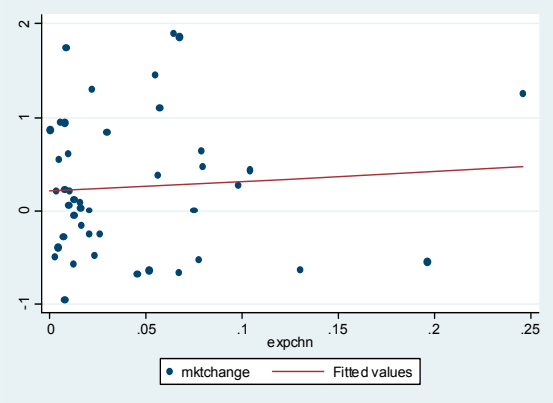
	(1)	(2)	(3)	(4)	(5)
Component sector*(Exports to China)	-2.16***	-1.43***			-1.30***
	[0.25]	[0.38]			[0.39]
Component sector	0.19***				
	[0.030]				
(Exports to China)	-0.57***	0.34			0.35
	[0.21]	[0.23]			[0.23]
Imports from China *China's processing exports			-0.65*	-0.60**	-0.41
			[0.35]	[0.30]	[0.38]
Imports from China			0.46**	0.35	0.27
			[0.23]	[0.22]	[0.22]
China's processing exports			0.098		
			[0.10]		
Beta*Market return		0.71***		0.71***	0.71***
		[0.032]		[0.033]	[0.033]
Firm-Size		-0.0090		-0.0092	-0.0089
		[0.011]		[0.011]	[0.011]
Book/Market value		0.045*		0.045*	0.043
		[0.026]		[0.026]	[0.026]
Constant	0.45***		0.35***		
	[0.027]		[0.038]		
Country dummies	n	y	n	y	y
Date dummies	n	y	n	y	y
Sector dummies	n	y	n	y	y
Observations	42,860	40,800	42,458	40,423	40,423
R-squared	0.001	0.111	0.000	0.111	0.111

Robust standard errors in brackets

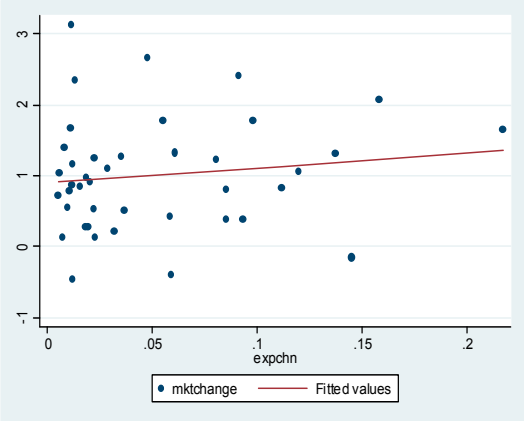
*** p<0.01, ** p<0.05, * p<0.1

Figure 1. Correlation of stock market return (vertical axis) and trade exposure to China (horizontal axis) around the time of two PBOC announcements

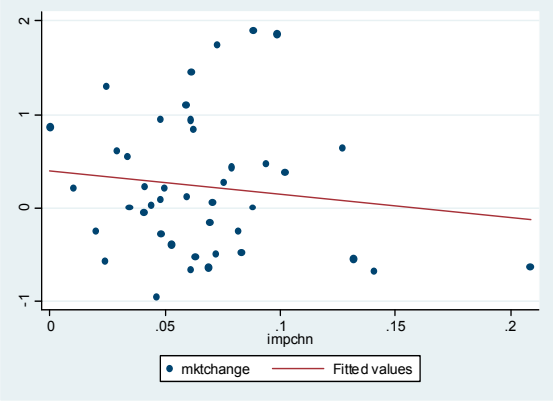
Exports exposure to China, measured by exports to China over total exports, for PBOC announcement in 2005.



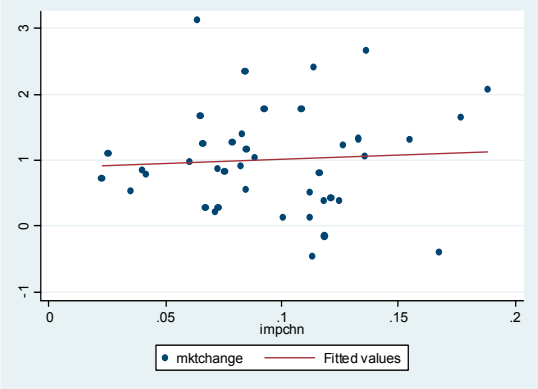
Exports exposure to China, measured by exports to China over total exports, for PBOC announcement in 2010.



imports from China, as measured by imports from China over total imports, for PBOC announcement in 2005.



imports from China, as measured by imports from China over total imports, for PBOC announcement in 2010 .



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