Online Appendix

Uninvited U.S. Investors? Economic Consequences of Involuntary Cross-listings

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1. Controlling for Potential Outlier Firms in the Firm Valuation Tests

To ensure that our valuation effect is not driven by a few outlier firms that experienced large changes in Tobin's q over our sample period, we perform a number of additional robustness tests. Before we detail these new tests, we would first note that in all current Table 2 models, the variable Tobin's q is already winsorized at the 1% and 99%. As we detail below, the results of these additional tests that control for the distribution of the valuation effects continue to show statistically significant results, consistent with our initial findings.

First, to ensure that our results are not driven by a few unsponsored ADRs that experienced a large change in Tobin's q over our sample period, we calculate changes in Tobin's q pre- and post-cross-listing for all unsponsored ADR firms. Then we sort unsponsored ADR firms by their change in q and drop the top and bottom 1%. Thus, we drop these firms with "extreme" q changes that potentially drive the valuation effect. We then match this sample of unsponsored ADR firms with control firms based on our two matching approaches, i.e., matching on pre-cross-listing Tobin's q, country, and industry, and matching using a propensity score approach. Finally, we re-run our valuation tests based on these two matched samples. The results are shown in Table A1 below.

The coefficient of interest, *Unsponsored ADR Firm After Cross-listing*, is negative and significant with p-values of at least 5% in all four models.[1] Further, the average valuation effect across all four models is -4.33%. Alternatively, instead of dropping the top and bottom 1%, we drop the top and bottom 2.5% of unsponsored ADR firms and find a similar average valuation effect of -4.30%.

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[1] Since we first drop the top and bottom 1% of unsponsored ADR firms and then match the remaining firms to control firms, the number of observations of the new matched samples are not equal to the number of observations shown in Table 2 less 2%.

Second, we pursue an alternative approach to make sure that our results are not driven by outlier firms. For each matched firm-pair (unsponsored ADR firm and control firm based on our two matching techniques) we calculate the difference in the change in Tobin's q pre- and post-cross-listing between the unsponsored ADR firm and its matched control firm, and drop the top and bottom 1% of the matched pairs. This approach eliminates unsponsored ADR firms that had extreme q changes *relative* to their matched control firm. Using these matched samples, we re-run our valuation tests. The results are reported in Table A2. Similar to the previous findings in Table A1, the valuation effect is statistically significant with p-values of less than 5%, and the average valuation impact is -3.91% across all four models. When we drop the top and bottom 2.5% of firm-pairs, the average valuation effect is -3.81%. This again shows that our main results are not driven by a few outlier observations.

Table A1
Firm Valuation Effects for Firms with Unsponsored ADRs: Dropping Unsponsored ADR Firms with Large Changes in Tobin's *q*

The table shows firm valuation effects for firms with unsponsored ADRs using matched samples. In models 1 and 2 we match firms based on Tobin's *q*, country, and 2-digit SIC codes measured in the year before the new regulation was implemented. In models 3 and 4 we match firms based on a propensity score approach using firm size, insider control, market-to-book, leverage, profitability, bid-ask spread, whether the firm is a member of a major index, country, and industry dummies as matching variables. We use difference-in-differences regressions to measure the valuation effect for firms with unsponsored ADRs for the three year period surrounding the rule change. The dependent variables are *Tobin's q* and *Relative Tobin's q*. *Tobin's q* is ((total assets – book value of equity + market value of equity) / total assets) and *Relative Tobin's q* is *Tobin's q* divided by the average *Tobin's q* in a given year of all domestic firms within the same industry in the firm's home country. *Unsponsored ADR Firm After Cross-listing* is a dummy variable equal to one if the firm is cross-listed via an unsponsored ADR in a particular year, zero otherwise. *Country Industry q* is the average Tobin's *q* across all firms in a given year, country, and industry. *Log (Sales)* is the logarithm of net sales in million US$. *Sales Growth* is the average two-year sales growth. We include all non-U.S. firms available in Worldscope. We exclude firms that do not have publicly traded equity or have total assets less than $10 million. All variables are winsorized at 1% and 99%; we also sort all unsponsored ADR firms based on their change in Tobin's *q* pre- and post-cross-listing and drop the top and bottom 1% prior to creating the matched samples. Cross-listing data are from DR lists from Bank of New York, J.P. Morgan, and Citigroup, CRSP files, and SEC Form F-6 filings. Firm-level data are obtained from Thomson Reuters Worldscope and Thomson Reuters Datastream. All models are estimated with firm fixed effects and include year dummies (not reported). Standard errors are robust to heteroskedasticity and clustered at the country-industry group level; *t*-statistics are reported in parentheses; ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. The last row of the table shows the average change in Tobin's *q* upon cross-listing implied by the coefficient estimate of *Unsponsored ADR Firm After Cross-listing*.

	Matched on Tobin's *q*, Industry, and Country		Propensity Score Matching	
	Tobin's *q*	Relative Tobin's *q*	Tobin's *q*	Relative Tobin's *q*
	(1)	(2)	(3)	(4)
Unsponsored ADR Firm After Cross-listing	-0.101***	-0.045***	-0.077**	-0.047***
	(-3.27)	(-2.75)	(-2.53)	(-3.53)
Country Industry *q*	0.909***		0.911***	
	(13.42)		(16.85)	
Log (Sales)	-0.096*	-0.017	-0.114*	-0.007
	(-1.87)	(-0.67)	(-1.89)	(-0.29)
Sales Growth	0.046	0.019	0.065*	0.027*
	(1.57)	(1.32)	(1.87)	(1.89)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Number of Observations	3,750	3,750	3,990	3,990
Adjusted R^2	0.44	0.01	0.50	0.01
Average Change in Tobin's *q* based on the coefficient estimate of *Unsponsored ADR Firm After Cross-listing* and firms' Tobin's *q* prior to cross-listing	-5.19%	-4.07%	-3.83%	-4.22%

Table A2
Firm Valuation Effects for Firms with Unsponsored ADRs: Dropping Matched Firm Pairs with Large Differences in Changes in Tobin's *q*

The table shows firm valuation effects for firms with unsponsored ADRs using matched samples. In models 1 and 2 we match firms based on Tobin's *q*, country, and 2-digit SIC codes measured in the year before the new regulation was implemented. In models 3 and 4 we match firms based on a propensity score approach using firm size, insider control, market-to-book, leverage, profitability, bid-ask spread, whether the firm is a member of a major index, country, and industry dummies as matching variables. We use difference-in-differences regressions to measure the valuation effect for firms with unsponsored ADRs for the three year period surrounding the rule change. The dependent variables are *Tobin's q* and *Relative Tobin's q*. *Tobin's q* is ((total assets – book value of equity + market value of equity) / total assets) and *Relative Tobin's q* is *Tobin's q* divided by the average *Tobin's q* in a given year of all domestic firms within the same industry in the firm's home country. *Unsponsored ADR Firm After Cross-listing* is a dummy variable equal to one if the firm is cross-listed via an unsponsored ADR in a particular year, zero otherwise. *Country Industry q* is the average Tobin's *q* across all firms in a given year, country, and industry. *Log (Sales)* is the logarithm of net sales in million US$. *Sales Growth* is the average two-year sales growth. We include all non-U.S. firms available in Worldscope. We exclude firms that do not have publicly traded equity or have total assets less than $10 million. All variables are winsorized at 1% and 99%; we also calculate for each matched firm-pair the difference in the change in Tobin's *q* pre- and post-cross-listing and drop the top and bottom 1%. Cross-listing data are from DR lists from Bank of New York, J.P. Morgan, and Citigroup, CRSP files, and SEC Form F-6 filings. Firm-level data are obtained from Thomson Reuters Worldscope and Thomson Reuters Datastream. All models are estimated with firm fixed effects and include year dummies (not reported). Standard errors are robust to heteroskedasticity and clustered at the country-industry group level; *t*-statistics are reported in parentheses; ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. The last row of the table shows the average change in Tobin's *q* upon cross-listing implied by the coefficient estimate of *Unsponsored ADR Firm After Cross-listing*.

	Matched on Tobin's *q*, Industry, and Country		Propensity Score Matching	
	Tobin's *q*	Relative Tobin's *q*	Tobin's *q*	Relative Tobin's *q*
	(1)	(2)	(3)	(4)
Unsponsored ADR Firm After Cross-listing	-0.099***	-0.034**	-0.066**	-0.047***
	(-3.33)	(-2.29)	(-2.26)	(-3.59)
Country Industry *q*	0.937***		0.984***	
	(13.05)		(13.77)	
Log (Sales)	-0.080*	-0.005	-0.113	-0.006
	(-1.72)	(-0.23)	(-1.56)	(-0.22)
Sales Growth	0.056*	0.022*	0.079**	0.034**
	(1.93)	(1.73)	(2.22)	(2.23)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Number of Observations	3,726	3,726	4,038	4,038
Adjusted R^2	0.48	0.01	0.52	0.01
Average Change in Tobin's *q* based on the coefficient estimate of *Unsponsored ADR Firm After Cross-listing* and firms' Tobin's *q* prior to cross-listing	-5.04%	-3.09%	-3.29%	-4.22%

2. Including Measures of Momentum to the Propensity Score Matching Approach in the Firm Valuation Tests

We re-run the propensity score matching including past stock returns to control for momentum. We follow Jegadeesh and Titman (1993) and proxy for momentum with 3, 6, 9, and 12-months past stock returns. Table A3 shows the results of the valuation effect for the full sample. The coefficient estimates on *Unsponsored ADR Firm After Cross-listing* are very similar to the original results of Table 2. Thus, adding past stock returns to the propensity score matching to control for momentum does not seem to have a sizable effect on our results above and beyond our performance variables we already include, that is, market-to-book and profitability.[2]

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[2] The number of observations in models 1 and 2 are slightly lower than for models 3 and 4. This is not because there are fewer 3-months returns available, but because the propensity score matching approach yields slightly less matched firm-pairs when using 3-months returns than when using 6-months returns.

Firm Valuation Effects for Firms with Unsponsored ADRs: Including Past Stock Returns in Propensity Score Matching

The table shows firm valuation effects for firms with unsponsored ADRs using matched samples. We match firms based on a propensity score approach using firm size, insider control, market-to-book, leverage, profitability, bid-ask spread, whether the firm is a member of a major index, country, industry dummies, and 3, 6, 9, or 12-month past stock returns as matching variables. We use difference-in-differences regressions to measure the valuation effect for firms with unsponsored ADRs for the three year period surrounding the rule change. The dependent variables are *Tobin's q* and *Relative Tobin's q*. *Tobin's q* is ((total assets – book value of equity + market value of equity) / total assets) and *Relative Tobin's q* is *Tobin's q* divided by the average *Tobin's q* in a given year of all domestic firms within the same industry in the firm's home country. *Unsponsored ADR Firm After Cross-listing* is a dummy variable equal to one if the firm is cross-listed via an unsponsored ADR in a particular year, zero otherwise. *Country Industry q* is the average Tobin's q across all firms in a given year, country, and industry. *Log (Sales)* is the logarithm of net sales in million US$. *Sales Growth* is the average two-year sales growth. We include all non-U.S. firms available in Worldscope. We exclude firms that do not have publicly traded equity or have total assets less than $10 million. All variables are winsorized at 1% and 99%. Cross-listing data are from DR lists from Bank of New York, J.P. Morgan, and Citigroup, CRSP files, and SEC Form F-6 filings. Firm-level data are obtained from Thomson Reuters Worldscope and Thomson Reuters Datastream. All models are estimated with firm fixed effects and include year dummies (not reported). Standard errors are robust to heteroskedasticity and clustered at the country-industry group level; *t*-statistics are reported in parentheses; ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. The last row of the table shows the average change in Tobin's q upon cross-listing implied by the coefficient estimate of *Unsponsored ADR Firm After Cross-listing*.

	Propensity Score Matching including							
	3-months Stock Return		6-months Stock Return		9-months Stock Return		12-months Stock Return	
	Tobin's q	Relative Tobin's q	Tobin's q	Relative Tobin's q	Tobin's q	Relative Tobin's q	Tobin's q	Relative Tobin's q
	(1)	(2)	(3)	(4)				
Unsponsored ADR Firm After Cross-listing	-0.072**	-0.049***	-0.081**	-0.055***	-0.070**	-0.052***	-0.085**	-0.057***
	(-2.18)	(-3.33)	(-2.53)	(-3.74)	(-2.03)	(-3.22)	(-2.38)	(-3.77)
Country Industry q	1.019***		0.982***		1.007***		1.020***	
	(11.84)		(14.00)		(13.59)		(13.21)	
Log (Sales)	-0.343***	-0.114**	-0.262**	-0.096	-0.314**	-0.129*	-0.253**	-0.089
	(-3.41)	(-2.13)	(-2.26)	(-1.62)	(-2.39)	(-1.88)	(-1.98)	(-1.35)
Sales Growth	0.090**	0.040***	0.114***	0.047***	0.096***	0.041***	0.100***	0.047***
	(2.17)	(2.60)	(3.08)	(2.91)	(2.63)	(2.65)	(2.71)	(2.92)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	4,056	4,056	4,062	4,062	4,068	4,068	3,990	3,990
Adjusted R^2	0.49	0.02	0.48	0.02	0.45	0.02	0.48	0.02
Average Change in Tobin's q based on the coefficient estimate of *Unsponsored ADR Firm After Cross-listing* and firms' Tobin's q prior to cross-listing	-3.55%	-4.42%	-3.99%	-4.93%	-3.42%	-4.67%	-4.17%	-5.10%

3. "As-if" Valuation Analysis in 2008

We seek to investigate the question of why firms that were not initially chosen by banks, but were probably aware of the first wave of unsponsored ADRs, did not immunize after the first wave of unsponsored ADRs. To this end we identified 119 firms that were involuntarily listed after the first wave of unsponsored ADR programs. Therefore, these firms could observe the creation of unsponsored ADRs in late 2008 and were in a position at the end of 2008 to respond by initiating a sponsored program to prevent their future unsponsored listings. We would note, however, this experiment assumes a perfect foresight on the side of these 119 firms, as they were the ones that were subsequently involuntarily listed. Table A4 shows the results of this "as-if" analysis in 2008. We find that the average difference between the predicted and observed Tobin's q of unsponsored ADR firms is -0.10 and -0.12, corresponding to a -7.7% and -9.4% valuation change, respectively, when compared to sponsored OTC firms. This finding shows that even the firms that could have "immunized" were better off not to respond to the eventual unsponsored listings, even though it destroyed value. This evidence is consistent with the fact that we did not observe an increase in sponsored ADRs in 2008 or 2009.

Table A4
Firm Valuation Predictions from a Sponsored OTC ADR Model: "As-if" Analysis in 2008

The table estimates a standard cross-listing valuation regression (as in Doidge, Karolyi, Lins, Miller, and Stulz (2009), including country fixed effects) for sponsored OTC ADR in 2008, right after the first wave of unsponsored ADRs. The dependent variable is *Tobin's q* defined as ((total assets – book value of equity + market value of equity) / total assets). *Log (Sales)* is the logarithm of net sales in million US$. *Sales Growth* is the average two-year sales growth. *Global Industry q* is the median Tobin's *q* across all firms in a given year and industry. *Insider Control* is the percentage of closely held shares. Cross-listing data are from DR lists from Bank of New York, J.P. Morgan, and Citigroup, CRSP files, and SEC Form F-6 filings. Firm-level data are obtained from Thomson Reuters Worldscope and Thomson Reuters Datastream. Standard errors are robust to heteroskedasticity and clustered at the country-industry group level; *t*-statistics are reported in parentheses; ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. We use the estimated coefficients for sponsored OTC ADR firms (reported in the table) to form predicted Tobin's *q* for firms that had an unsponsored ADR initiated after December 31, 2008, and report the average difference between the predicted Tobin's *q* and the effective (observed) Tobin's *q* for the unsponsored ADR firms.

	Tobin's q	
	(1)	(2)
Log(Sales)	-0.031	-0.040*
	(-1.52)	(-1.77)
Sales Growth	0.100	0.111
	(1.10)	(1.11)
Global Industry q	0.836***	0.775***
	(4.24)	(3.52)
Insider Control		0.130
		(0.87)
Country Dummies	Yes	Yes
Number of Sponsored ADR Firms	798	703
Adjusted R^2	0.13	0.13
Number of Unsponsored ADR Firms	119	116
Predicted Tobin's q – Effective Tobin's q	-0.12	-0.10

4. The J.P. Morgan Case

J.P. Morgan has been involved in only a few unsponsored ADR programs, and decides case by case whether to cross-list foreign firms as unsponsored ADRs. Further, JPM claims to ask the foreign firm for "permission" prior to creating an unsponsored ADR:

"While we support the SEC rule change, we believe that new programs must be opened in a controlled manner and with the consent of the issuers," says Claudine Gallagher, New York-based global head of the depositary receipts group at J.P. Morgan, which accounts for only a fraction of the new unsponsored programs. "Our point of view is that the practice of opening programs without consent is neither good for the company involved nor the industry," she says.[3]

Thus, one would expect that any negative effect of unsponsored ADRs on foreign firms would be lower for firms for which JPM created an unsponsored ADR program. One caveat with this, however, is the very small number of unsponsored ADRs JPM has created. Hence, any evidence we may uncover lacks power and needs to be interpreted cautiously.

To examine whether JPM-unsponsored ADR firms experienced a different valuation effect than the other firms, we use the specifications of models 2 and 4 of Table 4 in the paper, and add a dummy variable that equals one for unsponsored ADRs created by JPM, and zero otherwise. Table A5 shows the results. In both specifications, while controlling for changes in audit fees and ex-ante litigation risk, the coefficient on *JPM-Unsponsored ADR Firm* is positive with p-values of 0.13 and 0.10, indicating that JPM-unsponsored ADR firms experience a lower

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[3] See "1,000 Unsponsored ADR Programs Created In Last Three Months, Often Without Consent Of Issuers" by Gordon Platt, Global Finance, January 2009.

firm valuation impact than firms with unsponsored ADRs created by the other depositary banks only.

　　While these findings are consistent with our hypotheses, they need to be viewed cautiously since there are only 24 (model 1) and 30 (model 2) unsponsored ADR firms in the sample that were created by JPM.

Table A5
Firm Value and JPM-unsponsored ADR firms

The table shows regression estimates of the *Change in Tobin's q* on *JPM-Unsponsored ADR Firm*, a dummy variable that equals one for unsponsored ADRs created by JPM, and zero otherwise. The dependent variable is the *Change in Tobin's q* calculated as Log (Tobin's q_{2009} / Tobin's q_{2007}). The *Change in Audit Fees* is measured as Log (Audit Fees$_{2009}$ / Audit Fees$_{2007}$). Tobin's *q* is ((total assets – book value of equity + market value of equity) / total assets). The *Change in Risk* is the log of the standard deviation of monthly stock returns measured in 2009 divided by the standard deviation of monthly stock returns measured in 2007. *Litigation Risk* is the probability of litigation estimated based on the coefficients in model 3 of Table 7 of Kim and Skinner (2012) and firm-level variables measured prior to the regulation change and standardized to reflect the same mean and standard deviation as the variables reported in Table 6 of Kim and Skinner (2012). *Log (Sales)* is the logarithm of net sales in million US$. *Sales Growth* is the average two-year sales growth. *Country Industry q* is the average Tobin's *q* across all firms in a given year, country, and industry. We include all firms for which an unsponsored ADR was established. All variables are winsorized at 1% and 99%. Cross-listing data are from DR lists from Bank of New York, J.P. Morgan, and Citigroup, CRSP files, and SEC Form F-6 filings. Firm-level data are obtained from Thomson Reuters Worldscope and Thomson Reuters Datastream. Industry dummies and random country effects are included (not reported). We verify that the Hausman test does not reject the null that country effects are random. Standard errors are robust to heteroskedasticity and clustered at the country level; *t*-statistics are reported in parentheses; ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

	Change in Tobin's q	
	(1)	(2)
JPM-Unsponsored ADR Firm	0.061	0.040*
	(1.51)	(1.67)
Change in Audit Fees	-0.054***	
	(-2.98)	
Litigation Risk		-0.650***
		(-2.60)
Change in Risk	-0.050***	-0.040**
	(-3.05)	(-2.53)
Log (Sales)	0.025***	0.048***
	(2.65)	(3.42)
Sales Growth	-0.038	-0.051
	(-0.88)	(-1.59)
Country Industry *q*	-0.072***	-0.036*
	(-2.96)	(-1.74)
Industry Dummies	Yes	Yes
Number of Observations	472	642
R^2	0.25	0.29

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