

INDUSTRY TRADE BALANCE AND DOMESTIC MERGER POLICY: EMPIRICAL EVIDENCE FROM U.S. MERGER POLICY FOR MANUFACTURING SECTORS

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The literature on antitrust in an open-economy setting is inconclusive with respect to the role played by trade balance on the tenor of domestic merger policy. Using a panel dataset composed of U.S. merger reviews by industrial sector over the 1982–2001 period, I empirically test the impact of sectoral trade balance on the level of antitrust scrutiny. The results suggest that larger trade balances lead to more vigorous antitrust scrutiny; thus “strategic” merger policy does not appear evident, and consumer surplus appears to guide U.S. merger policy even under the lure of international competitive gains.

I. INTRODUCTION

A voluminous literature (e.g., Williamson, 1968; Fisher, 1987; White, 1987; Farrell and Shapiro, 1990) exists concerning the welfare effect of mergers involving only domestic competitive implications; that is, domestic merger activity within a closed economy. Globalization, however, is fast fictionalizing the notion that merger policy can be completely embedded within one nation (Melamed, 2000). Accordingly, the intersection between trade and competition policy—a previously neglected topic—has recently received a great deal of scholarly attention (e.g., Richardson, 1999; Vandebussche, 2000; Horn and Levinsohn, 2001). Further, and closer to the topic at hand, a growing dialogue exists on the design of merger policy in an open-economy setting (e.g., Barros and Cabral, 1994; Levinsohn, 1997; Head and Ries, 1997; Neven and Röller, 2000b, 2003; Mavrodís and Neven, 2001; Zhang and Chen, 2002). Such debate is particularly healthy, as the globalization of mergers and acquisitions suggests that larger nations with commitments to antitrust (e.g., the United States) will increasingly face the dilemmas previously experienced by midsize nations with commitments to antitrust (e.g., the United Kingdom and Germany).

The question motivating this work is how does the industry trade balance impact the

tenor of merger policy for a specific industry sector. Within the above dialogue on merger policy in an open-economy setting exists a sub-literature that specifically considers the impact of industry trade balance on optimal domestic merger policy. Invoking various oligopolistic scenarios, Barros and Cabral (1994), Head and Ries (1997), Levinsohn (1997), Sorgard (1997), Yano (2001), and Zhang and Chen (2002)—all find positive (negative) trade balances to conditionally favor more lenient (strict) domestic merger policy. Explicit in all these works is that antitrust agencies face a national welfare criterion of which foreign producers and consumers are not part; yet consumer surplus (not national welfare) is the stated criterion for many antitrust agencies. Moreover, Landes and Posner (1981), Ghosal (2002), and others make the intuitive argument that imports ameliorate anticompetitive behavior in domestic markets, thus suggesting the converse of above: Positive (negative) trade balances conditionally favor strict (lenient) domestic merger policy. Such discord is made more problematic once one recognizes the political economic nature of antitrust, the dangers of using “strategic” merger policy, and the bureaucratic discretion held by most antitrust authorities.

ABBREVIATIONS

US: United States
SIC: Standard Industrial Classification
DOJ: US Department of Justice
FTC: US Federal Trade Commission
EU: European Union

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It remains difficult then to theoretically predict how trade balance impacts the tenor of domestic merger policy. Solving how—and whether—an industry trade profile alters domestic merger policy is ultimately an empirical question. Consequently I test here the impact of trade balance on merger policy outcomes in the U.S. manufacturing industrial sectors. A comprehensive panel dataset—covering U.S. merger policy at the two-digit standard industry classification (SIC) code level over the 1982–2001 period—allows testing whether trade balance acts to promote strict or lenient merger policy. The empirical results support higher trade balances leading to stricter merger policy.

The article is organized as follows to support the analysis. Section II reviews the competing theories on how trade balance might impact the nature of domestic merger policy and formulates two competing propositions that motivate the empirical testing. Section III presents the results of the empirical tests. Section IV concludes.

II. THEORIES AND COMPETING PROPOSITION FORMULATION

Barros and Cabral (1994) sparked the sub-literature on trade balance and the optimal tenor of domestic merger policy in an open-economy setting with their extension of Farrell and Shapiro's (1990) pioneering approach to mergers in a closed economy. The Barros and Cabral setup consequently conforms rather closely to that of Farrell and Shapiro in a number of dimensions. First is the adoption of Farrell and Shapiro's external effect decision criterion, where mergers are assumed to be profitable for the merging parties, thus a positive net impact on nonmerging parties (nonmerging home firms and home consumers) is a sufficient condition for supporting a merger. Second is the employment of Farrell and Shapiro's innovative infinitesimal method, a technique consisting of defining the effect of a merger as the sum of many infinitesimal price increases, which allows capturing the merger effect by investigating the impact of an infinitesimal price increase and specifying sufficiency conditions for the sign of the marginal price increase to be valid.

In extending the Farrell and Shapiro (1990) setup, however, Barros and Cabral (1994) find a somewhat counterintuitive result: the more

foreign competition faced by a national economy, the less likely will a domestic merger enhance national welfare. Recall that under Farrell and Shapiro (1990), a positive external effect keys on the increased profitability of nonmerging firms; yet Barros and Cabral (1994) point out that when nonmerging firms are mostly foreign (e.g., in an industry with a negative trade balance), then the external effect is more likely to be negative. The converse is true for exporting economies: in this case, the positive external effect is more readily satisfied, as the profit gains of domestic firms are more likely to outweigh domestic consumer losses. Consequently positive trade balance nations reap the majority of a merger's beneficial effects, while negative trade balance nations reap the majority of the merger's detrimental effects.

Sorgard's (1997) study follows closely Barros and Cabral's work (adopting the infinitesimal method, the lack of merger synergies, and postmerger price increases), but discards the external effect criterion for a national welfare criterion. Sorgard points out that a price-increasing merger in a negative trade balance nation will unambiguously harm home nation welfare, as the deadweight loss and increased import expenditures go unmitigated. Conversely, domestic mergers in a positive trade balance nation can enhance home nation welfare when the price cost margin from the world market is greater than that in the domestic market; that is, less competitive foreign firms favor a domestic merger improving home nation welfare.

Zhang and Chen (2002) take a different approach and consider the presence of scale economies for domestic mergers in an open-economy setting. They extend Krugman's (1984) work on the ability of trade policy to promote exports by allowing competition policy to also promote exports. Zhang and Chen thus find that domestic mergers in exporter industries more readily improve home nation welfare due to the shift in oligopolistic rents from foreign to home producers. They further observe that positive trade balances lower the critical economies of scale value necessary for permitting a domestic merger; that is, when domestic mergers result in enhanced international rents, then fewer merger synergies are required for home nation welfare enhancement.

Even Head and Ries (1997)—who argue that the prevailing antitrust authorities will block nonsynergistic domestic mergers that reduce

world welfare—find a similar dynamic in their model of decentralized merger regulation, as national welfare maximizing authorities cannot be trusted with synergistic domestic mergers that reduce world welfare. Head and Ries state “a home country government is less likely to approve a merger if the merging firms’ rivals are owned by foreigners” (1997, p. 1119). Further, two additional studies (Levinsohn, 1997; Yano, 2001) that take even more varied modeling decisions also find domestic mergers more readily improving home nation welfare under positive trade balances.

In sum, the above studies cover a number of different cases—a necessity when it comes to oligopolistic market structures—yet all the studies contain a clear and common contention concerning the relationship between a national industry’s trade balance and optimal merger policy.¹ The common intuition behind the studies runs along the following lines: national welfare—with the typical producer gains/consumer losses trade-off—is the ultimate criterion for domestic merger reviews [even Barros and Cabral’s (1994) approach is meant as a shortcut to national welfare], and in an open-economy setting, home producer gains are more (less) likely to outweigh any potential home consumer losses when an industry is characterized by positive (negative) trade balances. Put differently, the producer gain/consumer loss trade-off begins to vanish when the consumers involved are foreign; instead, the search for international rents guides policy (Levinsohn, 1997). Consequently antitrust officials face a national welfare incentive to practice lax reviews of domestic mergers in positive trade balance industries and strict reviews in negative trade balance industries. The following proposition captures the public policy implications of the above literature stream:

PROPOSITION 1. *Greater (lesser) trade balances for a national industry sector favor more lenient (strict) reviews of domestic merger activity under national welfare maximizing anti-trust objectives.*

Many antitrust officials (particularly from the United States) are loath to engage in any discussion of antitrust rationales that contain national-champion foundations—even if con-

finied to positive trade balance industries.² The main argument often used to counter any national rent-seeking notions is that national welfare is simply not the criterion used for merger decisions. Instead, the stated objective of U.S. antitrust policy is the promotion of consumer surplus and not national welfare (Gellhorn and Kovacic, 1994).³ Neven and Röller (2000b, 2003) also show that if antitrust officials strive to fulfill these goals, then there is little scope for conflict between antitrust jurisdictions.

If consumer surplus guides merger reviews, then the policy recommendations summarized by Proposition 1 are reversed to recommendations that appear far more intuitive from an economist’s perspective; that is, foreign competition and imports play a more healthy role vis-à-vis domestic merger reviews. A number of scholars (e.g., Landes and Posner, 1981; Abbot, 1985; Ghosal, 2002) have argued that foreign production involves important domestic antitrust implications. High imports imply broader geographic markets, dilute concerns over high domestic concentration, and—via the substitutability of foreign for domestic goods—lessen antitrust anxieties with regard to domestic merger activity. In order to fully factor this more intuitive link between trade balance and the tenor of domestic merger reviews, two effects must be considered.

First, import levels (which negatively affect trade balance) involve an obvious disciplinary effect in terms of domestic concentration. For instance, if antitrust officials excluded foreign competition from a competitive analysis, then domestic concentration levels would likely overstate market power. Abbott (1985) illustrates the importance of factoring foreign competition in the form of imports into any sound estimation of domestic market concentration and market power. A strong import presence (reflected by a negative trade balance) reduces the potential harm to home consumers from a domestic merger. However, if a national industry is characterized by a positive trade balance, then it is less feasible to consider foreign firms as playing a mitigating role in terms of domestic anticompetitive behavior; that is, the more a nation has a positive trade balance, the less likely will foreign firms help ameliorate

2. See note 3 in Clougherty (2001) for anecdotal evidence.

3. See http://www.usdoj.gov/atr/public/div_stats/9142.htm (November 23, 2004) for an overview of how consumer interest guides U.S. antitrust enforcement.

1. See Clougherty and Zhang (2005) for a theoretical and empirical critique of that literature.

anticompetitive behavior on the part of domestic firms. Consequently, the more a national industry is characterized by a negative (positive) trade balance, the more (less) foreign competitors discipline domestic market power and guard domestic consumer surplus.

Second, the ability of foreign firms to divert output relatively quickly to increases in the price cost markups in domestic markets represents an additional discipline—beyond the absolute level of foreign imports—to anticompetitive behavior on the part of domestic firms (Landes and Posner, 1981). Yet foreign competitors are often discounted when it comes to defining domestic market concentration and market power, as domestic supply is deemed better able to constrain market power than foreign supply (Ordover and Willig, 1983; U.S. Department of Justice, 1997). The reasoning behind this assumption is that the ability of foreign firms to respond quickly to a drop in domestic production is constrained. Landes and Posner (1981) contend that the ability of foreign producers to divert products quickly to a domestic market undergoing postmerger competitive softening depends on the previous crossing of certain thresholds. Ghosal (2002) identifies three particular threshold domains: (1) foreign firms will need to have previously overcome trade and entry barriers; (2) foreign firms will need to have previously overcome distribution and advertising barriers; (3) foreign production costs will need to be relatively low in order to offset tariffs and transport costs. Note that the more a domestic industry is characterized by a negative trade balance, the more these qualifications have previously been overcome; that is, negative trade balances suggest that trade entry distribution advertising barriers have been overcome and that foreign firms have superior efficiency relative to domestic firms. Consequently the more a nation has a negative trade balance, the more foreign supply acts as a “full” source of market discipline for anticompetitive domestic practices.

The following proposition captures the gist of the public policy implications suggested by the above discussion:

PROPOSITION 2. *Greater (lesser) trade balances for a national industry sector favor more strict (lenient) reviews of domestic merger activity under consumer surplus maximizing antitrust objectives.*

Propositions 1 and 2 seemingly reduce to whether a nation targets national welfare or consumer surplus as the objective function for merger policy, thus suggesting that empirical tests—as proposed and conducted here—might be a trivial exercise. Yet such an abstraction suffers from three detractors: (1) the opening up of antitrust to political economic determinants; (2) the dangers of engaging in “strategic” merger policy; and (3) the bureaucratic discretion held by antitrust officials.

First, the analysis up to this point has taken an implicit “public interest” approach to explaining antitrust outcomes, yet a number of scholars (Pittman, 1977; Faith et al., 1982; Coate et al., 1990; Neven et al., 1998; Clougherty, 2002) consider antitrust outcomes to be—at least partially—subject to political pressure. For instance, Pittman (1977) finds U.S. firms to engage in increased lobbying behavior subsequent to intensive antitrust reviews of their industry by Department of Justice (DOJ) and Federal Trade Commission (FTC) officials. Further, Neven and Röller (2000a) hypothesize that consumer surplus standards may be optimal in the sense that producer surplus (the other element of a national welfare analysis) will express itself via the political process (note that consumer interests suffer from an obvious collective action handicap). Thus, under the case of a consumer surplus maximizing antitrust authority, the additional producer gains reaped by home producers in postmerger international markets, which might be particularly high under positive trade balances, would enhance the incentive for merging firms to increase their lobbying efforts in order to secure antitrust approval (Clougherty, 2002). Consequently antitrust authorities adopting a consumer surplus merger criterion may still practice more lax merger reviews when national industries are characterized with positive trade balances, though in this case, the impetus for such lax policies derives from the enhanced political pressure of domestic producers, as opposed to a “public interest” calculation.

Second, consider a national antitrust authority that adopts a national welfare objective for merger reviews. Even in this case, practicing lax antitrust for positive trade balance industries might suffer from many of the same objections—retaliation (Grossman, 1990), minimal actual gains (see Krugman and Smith, 1994), the nature of oligopolistic competition

(Eaton and Grossman, 1986), and the bidding up of domestic cost structures (Dixit and Grossman, 1984)—leveled at the strategic trade literature. Recall that Zhang and Chen (2002) consider the rationale to be lax with mergers as akin to Krugman's (1984) rationale for providing subsidies; essentially, lax merger reviews are a substitute for a strategic subsidy. Accordingly, practicing strategic merger policy might ultimately reduce national welfare; hence, engaging in such a policy might not truly maximize national welfare and thus might not be followed.

Lastly, the stated objectives of antitrust agencies must be understood in the context that antitrust officials often have significant bureaucratic discretion (Katzmann, 1980; Weingast and Moran, 1983). Bureaucratic discretion allows antitrust authorities to follow more informal—or even idiosyncratic—objectives. For instance, Neven et al. (1993) note that while the European Union (EU) did not formally provide for an efficiency defense in previous years, efficiencies did appear to have an informal impact on the merger review process. Boner and Krueger (1991) observe that antitrust authorities are often charged with noncompetition-related policy goals, for example, industrial, employment, and regional policy goals, as well as balance of payment goals. In this vein, Levinsohn (1997) argues that a number of nations contain both formal and informal procedures that allow international competitive gains to be factored in merger reviews. Even the United States—the paragon of strict antitrust policy—allows cartelization for export purposes under the Webb-Pomerene Act (GAO, 1973).⁴ Further, Kovacic and Shapiro (2000)—esteemed legal and economic scholars on antitrust issues, respectively—contend that declining economic productivity partly drove the lax U.S. antitrust policy of the 1980s. Accordingly, the various antitrust institutional environments (particularly home

antitrust institutions) appear at least partly amenable to factoring the international competitive effects of domestic merger activity.

In sum, it remains difficult to predict how industry trade balance will impact the tenor of domestic merger reviews from a theoretical standpoint. As a first cut, it appears that an antitrust authority's formal criteria—national welfare or consumer surplus—might suggest whether industry trade balance leads to lenient or strict merger policy, respectively. Yet once we open antitrust policy up to political economic determinants, the neat distinction between consumer surplus- and national welfare-driven merger policies becomes muddled. Further, engaging in lax merger reviews in order to shift international rents toward home producers does raise some similar caveats to the case of strategic trade policy. Lastly, antitrust authorities often have significant bureaucratic discretion that might allow the trade balance status of an industry to be considered during the merger review process. Consequently the role played by an industry's trade balance on the tenor of domestic merger policy is ultimately an empirical question.

III. EMPIRICAL TESTS AND RESULTS

Data cover U.S. vetted mergers by industrial sector over the 1982–2001 period. The United States represents one of the harder cases in which to find international competitive effects impacting antitrust policy, for several reasons: the United States has the longest antitrust tradition; the United States has relatively strong antitrust institutions; and the United States has a very large domestic market in which foreign trade and foreign competition still play a relatively small role—that is, the United States is the antithesis of a small open economy.⁵ Accordingly, the United

4. The U.S. DOJ does evaluate the “export trading certificates” from the Webb-Pomerene procedure to ensure no harm is incurred by domestic consumers. While the implications of allowing cartelization in one market on the competitive behavior in another market have not been greatly studied, one could imagine that facilitating cooperation in international markets may impact the collusive behavior in domestic markets. For instance, Dick (1990)—in a study that otherwise supports Webb-Pomerene export cartels as being driven both by international market power and international efficiency rationales—notes that Webb-Pomerene cartels can be expected to indirectly raise prices in the domestic market.

5. Using data from the World Bank for the year 2000 on the total value of a nation's exports relative to gross domestic product (GDP) allows some interesting comparisons: exports account for 87% of Ireland's GDP, 43% of Canada's, 33% of Germany's, 30% of Spain's, 29% of France's, 27% of the United Kingdom's, and 10% of the United States'. Nevertheless, it should be pointed out that U.S. manufacturing is relatively internationalized: in 2000, imports equated to 32% of the revenue for U.S. manufacturers, while exports equated to 13% of the revenue for U.S. manufacturers. Accordingly, the United States may actually be—at least with respect to manufacturing—far more representative of the rest of the world than the aggregate numbers here would suggest.

States may be a hard case in which to find a positive trade balance status contributing to lax antitrust or a negative trade balance status contributing to strict antitrust. Consequently, if one finds international competitive dynamics impacting U.S. merger policy, then it is a reasonable assumption to expect to find similar dynamics in other nations—nations more reliant on the role of foreign competition in protecting domestic consumers and more reliant on foreign trade for industrial competitiveness.

The data are panel data covering 17 manufacturing sectors over the 1982–2001 period, thus yielding a dataset composed of 318 observations. Each panel consists of a two-digit industrial sector; for instance, “Fabricated Metals” is one distinct panel consisting of 19 annual observations (1982–2001).⁶ While more specific industrial sector data is desired (such as three- or four-digit data), U.S. antitrust authorities only report data on antitrust activity at the two-digit level in the FTC and DOJ’s combined “Annual Report to Congress on Hart-Scott-Rodino Antitrust Enforcement.”⁷ In short, I employ the best available data on U.S. merger enforcement.

Despite the level of analysis being larger than is optimal, a previous debate on the implications of disaggregated data for general antitrust policy finds broad industry aggregation biases statistical results downward (see Long et al., 1973; Siegfried, 1975; Preston and Connor, 1992). These scholars find two-digit-level data make it more—not less—difficult to detect statistically robust causal relationships. Further, previous efforts to quantify merger enforcement have focused on price cost margins (e.g., Warzynski, 2001; Hoekman and Kee, 2003) and concentration ratios (e.g., Clougherty, 2001); accordingly, this empirical effort represents a contribution in itself, as it considers the actual decisions—albeit at a two-digit sector level—made by the U.S. regulatory authorities for antitrust.

Testing the propositions requires two principal variables: a measure of domestic antitrust scrutiny (the dependent variable) and a measure of industry trade balance (the main explanatory variable). Beyond the two principal variables, additional variables concerning

intraindustry merger activity, the market share of the 50 largest firms, and the relevant presidential administration are introduced in order to capture some of the structural conditions presented in each industry sector and in order to make better causal inferences on the main explanatory variable. The following paragraphs explain the variable measures.

The dependent variable must capture the state of domestic antitrust scrutiny for a particular industry sector. I use the annual number of “second-request investigations” divided by the total number of notified mergers in a particular industry sector as indicative of the level of scrutiny given mergers (subsequently referred to as the *Antitrust Scrutiny* variable). Second-request investigations denote serious concerns on the part of U.S. antitrust officials, who consequently require more information from the merging firms and more time to clear or contest the merger. This level of antitrust scrutiny is a prerequisite for serious remedial measures, such as divestments and outright prevention. Nevertheless, it should be pointed out that a proportion of mergers eliciting a second-request investigation will ultimately be cleared without any restrictions or remedial measures. Yet such investigations still represent a degree of antitrust scrutiny, as merging firms will be uncertain on the eventual outcome, required to divulge private information, and need to wait longer for clearance and completion of their intended strategy [see Clougherty (2005) for details on the U.S. merger review process]. Not surprisingly, many merging parties will call off an intended merger when notified that their proposed merger elicits a second-request investigation. Further, the combined FTC/DOJ “Annual Report to Congress on Hart-Scott-Rodino Antitrust Enforcement” reveals this measure of U.S. antitrust scrutiny.⁸

Testing the two competing propositions requires a measure of trade balance to examine whether greater trade balances lead to more strict or more lenient merger policy for an industrial sector. The U.S. International Trade Commission reports annual data on the amount of exports and imports for two-digit industrial sectors: these measures allow creating an absolute measure of sectoral trade balance by simply subtracting imports from exports to create

6. Note that no observations exist for 1986 due to missing data for that year.

7. See www.ftc.gov/bc/hsr/hsrinfopub.htm (November 24, 2004) for the 1997–2001 “Annual Reports to Congress.”

8. Unfortunately no other potential measures of antitrust scrutiny, such as the number of prohibitions or remedial actions, are provided in the annual reports.

a net exports measure. It is an open question though as to whether the absolute level of sectoral trade balance or a relative measure of trade balance (where net exports is divided by sectoral revenue) best measures trade balance; that is, a priori it is difficult to argue which is the better operationalization of the trade balance concept. Accordingly, I take an open approach and allow both measures (subsequently referred to as the *Trade Balance* variable). If Proposition 1 is correct, then trade balance will negatively affect antitrust scrutiny (i.e., the larger the sectoral trade balance, the more lenient will U.S. antitrust authorities be with regard to mergers). If Proposition 2 is correct, then trade balance will positively affect antitrust scrutiny (i.e., the lower the particular industry trade balance, the more strict will U.S. antitrust authorities be with regard to mergers).

The list of explanatory variables also includes the number of intraindustry mergers divided by the number of notified mergers in a particular two-digit industrial sector (subsequently referred to as the *Intraindustry Activity* variable). Mergers that involve acquirers and targets from the same industrial sector simply merit more attention than do mergers composed of pairs from different industry sectors. The combined FTC/DOJ annual report to Congress also reveals the number of merger transactions characterized as either two-digit or three-digit intraindustry transactions and the number of notified transactions per sector. I expect the *Intraindustry Activity* variable to positively affect antitrust scrutiny, thus the more the merger activity in a particular sector is characterized as intraindustry activity, the more antitrust officials should scrutinize the mergers and acquisitions taking place in that sector.

The U.S. Census Bureau (1997) provides more specific data—the market share held by the largest 50 firms—on the structural conditions for the 17 manufacturing sectors (subsequently referred to as *Top50 Market Share*).⁹ This variable helps better control for the structural conditions in which merger activity is embedded. Nevertheless, one big opportunity cost is presented with the inclusion of this structural variable: the data

derives from the U.S. Census of business activity and is thus reported only for 1997 and not on an annual basis. Accordingly, the variable will involve obvious measurement error for observations that rest further away from 1997; plus, the variable cannot be employed in any fixed effects regressions.

Previous empirical studies on U.S. antitrust enforcement have controlled for presidential administrations in order to factor the political environment in which antitrust policy is conducted. An example of an early study of U.S. antitrust cases that considers the impact of the presidency on enforcement activity is that of Posner (1970), while Ghosal and Gallo (2001) represent a more recent example. These empirical studies, as well as other studies in the literature, find that the presidency has little impact on antitrust outcomes; nevertheless, I include dummy variables for three (*Reagan*, *Bush1*, and *Clinton*) of the four presidencies covering the period of study in order to be as comprehensive as possible in grounding the econometric analysis in both the institutional context and the relevant literature.

A. *Econometric Issues*

Panel data require consideration of a number of econometric issues. This section considers and focuses on three issues: (1) the left-censored nature of the dependent variable; (2) the choice between fixed and random effects; and (3) the endogeneity of regressors.

First, the dependent variable—*Antitrust Scrutiny*—exhibits left censoring at zero, as a number of industry sectors were not subject to second-request investigations in particular years. Accordingly, the observed data contains a clustering of zeros and no negative values in terms of the annual number of second-request investigations for a particular industry sector. Such truncation of the data does not allow expressing any latent negative values for second-request investigations, thus calling for Tobit estimation for censored data (Tobin, 1958).

Second, panel data usually require a choice between fixed effects and random effects. Fixed effects models are called for when the panel-specific effects are unique and unrelated to other panels, while random effects models are often employed when panel-specific effects might be related among panels (Hsiao, 1986; Greene, 1990). A series of Lagrange multiplier and Hausman tests favor the choice of fixed

9. Unfortunately the market-share variable is reported at the three-digit North American Industry Classification (NAICS) level, yet a matching process—with some imperfections—was completed to convert these measures to a two-digit SIC level. Note further that this variable was omitted for the fixed effects regressions.

effects over random effects (Greene, 1995). Further, employing fixed effects is a more rigorous technique (particularly on a relatively small dataset) due to the large degrees of freedom required for this procedure—though the procedure will mandate the dropping of the *Top50 Market Share* variable.

Third, any endogeneity on the part of the explanatory variables that leads to correlation with the regression's error term would violate estimation assumptions and lead to inconsistent coefficient estimates. Endogeneity may owe to reciprocal causation, where the principal danger is that the dependent variable (*Antitrust Scrutiny*) potentially affects the main explanatory variable (*Trade Balance*), hence the coefficient estimates would lead to spurious causal inferences (Maddala, 1992). Such reciprocal causation—or simultaneity—would not be so surprising in light of theoretical inferences in the covered literature suggesting that merger policy affects exports. However, unreported Granger (1969) tests do not support reciprocal causation concerns. Endogeneity may also owe to omitted variables, where the omitted variables drive both the left- and right-side variables, again leading to spurious causal inferences. Unfortunately the regression model sketched out above omits some variables (e.g., the efficiencies involved with the proposed mergers, the number of failing firms in the sector, and entry barriers in the sector) that would at least be additional drivers of merger policy. Since I lack

data on the above concepts, the empirical results must be interpreted cautiously: the empirical evidence may support causal inferences, but in the end it will only yield definitive correlational inferences.

The regression models reported in the panel data regression results (Table 1) take the above econometric issues into account. All of the reported regressions undertake a Tobit transformation of the dependent variable. Regressions 1 and 2 report a base estimation and a fixed effects estimation, respectively, while employing the absolute-level measure of *Trade Balance*, while Regressions 3 and 4 report a base estimation and a fixed effects estimation, respectively, while employing the relative-level measure of *Trade Balance*. While four different regression models are presented in Table 1, Regressions 1 and 3 allow inclusion of all the empirical variables (due to their not running a fixed effects estimation), thus, for exhibition purposes, they are represented here as follows:

$$\begin{aligned} \text{Antitrust Scrutiny}_{it} &= b_0 + b_1(\text{Trade Balance})_{it} \\ &+ b_2(\text{Intraindustry Activity})_{it} \\ &+ b_3(\text{Top50 Market Share})_{it} \\ &+ b_4(\text{Reagan})_{it} \\ &+ b_5(\text{BushI})_{it} \\ &+ b_6(\text{Clinton})_{it} + \varepsilon_{it}, \end{aligned}$$

TABLE 1
Panel Data Tobit Estimation Results

	Regression Models with an Absolute-Level Trade Balance		Regression Models with a Relative-Level Trade Balance	
	Regression 1: Base Estimation	Regression 2: Fixed Effects Estimation	Regression 3: Base Estimation	Regression 4: Fixed Effects Estimation
Explanatory Variables				
Constant	−0.02 (0.037)	0.016 (0.049)	0.018 (0.038)	0.09 (0.087)
<i>Trade Balance</i>	0.0017*** (0.0006)	0.0017** (0.001)	0.273*** (0.055)	0.278* (0.178)
<i>Intraindustry Activity</i>	0.094*** (0.034)	0.021 (0.038)	0.048 (0.036)	0.022 (0.038)
<i>Top50 Market Share</i>	0.0012*** (0.0004)		0.0008*** (0.0004)	
<i>Reagan</i>	−0.027 (0.035)	−0.013 (0.035)	−0.022 (0.034)	−0.007 (0.035)
<i>BushI</i>	−0.055* (0.036)	−0.044 (0.037)	−0.047 (0.036)	−0.037 (0.036)
<i>Clinton</i>	−0.071** (0.037)	−0.036 (0.038)	−0.051 (0.038)	−0.032 (0.038)
Log-Likelihood	36.6	78.1	53.4	77.8
Observations	318	318	318	318
Dependent Variable: <i>Antitrust Scrutiny</i>				

Standard errors are in parentheses.

***2.5% significance, **7.5% significance, *15% significance.

where i indexes the 17 industrial sectors and t indexes time.

Table 2 presents descriptive statistics on the data covering the 17 manufacturing sectors. The top half reports the means, standard deviations, and correlation coefficients for the five main variables. Note that none of the variables, not even the two measures of *Trade Balance*, exhibit correlation coefficients above the 0.5 benchmark for eliciting further concern regarding colinearity. The lower half of Table 2 provides a more detailed description of the manufacturing sectors that make up the data. Note that all but two industries (Tobacco with 15 and Leather Products with 18 observations) involve a full 19 observations over

the 1982–2001 period (recall that no data exist for 1986), hence the data are almost balanced. Further, the ratio of within-panel variance to between-panel variance is the following for the three principal variables: 5.38 for *Antitrust Scrutiny*, 0.475 for the absolute measure of *Trade Balance*, and 0.126 for the relative measure of *Trade Balance*.

B. Results and Interpretation

Table 1 presents the empirical results for four regression models. The four regression equations deliver generally consistent results for the coefficient estimates—all the common variables point in the same direction. Due to

TABLE 2
Descriptive Statistics

	<i>Antitrust Scrutiny</i>	<i>Trade Balance</i> (absolute measure)	<i>Trade Balance</i> (relative measure)	<i>Intraindustry Activity</i>	<i>Top50 Market Share</i>
Correlation Coefficients, Means, and Standard Deviations for all 318 Observations					
Mean	0.0542	−6.713	−0.126	0.402	50.12
Std. Deviation	0.0798	13.522	0.272	0.273	19.65
<i>Antitrust Scrutiny</i>	1.0				
<i>Trade Balance</i> (absolute measure)	0.147 (0.0086)	1.0			
<i>Trade Balance</i> (relative measure)	0.240 (0.0001)	0.457 (0.0001)	1.0		
<i>Intraindustry Activity</i>	0.029 (0.6045)	0.082 (0.1450)	0.245 (0.0001)	1.0	
<i>Top50 Market Share</i>	0.193 (0.0005)	−0.096 (0.0889)	0.008 (0.8887)	−0.035 (0.5352)	1.0
<i>P</i> -values are in parentheses.					
Means and Observation Numbers by Manufacturing Sector					
Food & Kindred (19)	0.0726	2.2058	0.0050	0.6129	51
Tobacco (15)	0.0833	3.2045	0.1028	0.3433	84
Textile Mill (19)	0.0129	−1.4039	−0.0211	0.4605	53
Apparel & Other (19)	0.0105	−29.8502	−0.4322	0.3386	39
Lumber & Wood (19)	0.0519	−3.3700	−0.0340	0.4275	38
Furniture & Fixtures (19)	0.0198	−5.3594	−0.1027	0.3738	37
Paper & Allied (19)	0.0466	−2.1848	−0.0177	0.4926	67
Chemicals & Allied (19)	0.0858	13.3875	0.0469	0.4843	51
Petroleum & Coal (19)	0.1270	−8.3924	−0.0487	0.4071	90
Rubber & Misc. Plastic (19)	0.0427	−3.6673	−0.0300	0.3482	29
Leather (18)	0.0000	−10.2091	−1.0140	0.0853	65
Stone, Clay & Glass (19)	0.0747	−3.4448	−0.0458	0.4756	42
Primary Metals (19)	0.0714	−13.2478	−0.0900	0.4041	54
Fabricated Metals (19)	0.0405	−1.1860	−0.0055	0.3922	18
Industrial Machinery (19)	0.0728	0.5121	0.0129	0.4270	34
Transportation (19)	0.0785	−31.6851	−0.0751	0.3626	78
Misc. Manufacturing (19)	0.0333	−17.5218	−0.3975	0.3709	30
Observations by manufacturing sector are in parentheses.					

the general consistency of results across the regression models, the following analysis and interpretation discusses the results as a whole with a variable-by-variable approach.

The *Trade Balance* variable is instrumental in testing Propositions 1 and 2, and generates relatively robust results, as the coefficient estimate is positive and significant in all four regression specifications (2.5% level for Regressions 1 and 3; 7.5% level for Regression 2; and 15% level for Regression 4). Accordingly, the empirical evidence supports Proposition 2 over Proposition 1, as more positive trade balances lead to more antitrust scrutiny.

The *Intraindustry Activity* variable is included to make better causal inferences on the *Trade Balance* variable. Further, we expect a positive sign for the *Intraindustry Activity* variable, as merger activity in industry sectors characterized by greater levels of intraindustry mergers should elicit more antitrust scrutiny from regulators. While the coefficient estimate for *Intraindustry Activity* is positive in all four regression models, it is only significant (at the 15% level) in Regression 1. In essence, the results tentatively suggest that U.S. antitrust agencies act in the public interest by giving additional merger scrutiny to industries that are subject to a great deal of intraindustry activity.

In addition, *Top50 Market Share* was included in Regressions 1 and 3 to better control for the structural conditions in the industry sector. The coefficient estimate for *Top50 Market Share* exhibits the expected positive sign and is significant at the 2.5% level in both regressions where it is employed. Accordingly, manufacturing industry sectors characterized as highly concentrated tend to elicit increased levels of antitrust scrutiny.

Lastly, dummy variables for three different presidential administrations (*Reagan*, *Bush1*, and *Clinton*) are included to act as control variables and in order to determine whether antitrust scrutiny of manufacturing industries is affected by presidential authority. The only significant coefficient estimates fall in Regression 1, where the *Bush1* and *Clinton* administrations are found to treat merger activity more leniently relative to *Bush2* in 2001 (the omitted presidential dummy variable). This may owe to the fact that both *Bush1* and *Clinton* experienced an upsurge of merger activity (particularly compared to the economically

special year of 2001), as antitrust officials simply lacked the resources to fully investigate mergers at normal levels. Nevertheless, the presidential dummy variables do not involve consistent significance across the regressions; accordingly, strong inferences should not be made from these results.

In sum, the empirical results appear to support Proposition 2 over Proposition 1. There appears to be scant evidence in support of the contention that U.S. antitrust authorities practice more lenient merger policy in industrial sectors characterized by positive trade balances. Instead, positive trade balances appear to enhance the scrutiny of merger activity by U.S. antitrust authorities.

IV. CONCLUSION

The existing literature on merger policy in an open-economy setting presents two competing rationales on how sectoral trade balances might impact the tenor of domestic merger policy. Some scholars (Barros and Cabral, 1994; Head and Ries, 1997; Levinsohn, 1997; Sorgard, 1997; Yano, 2001; Zhang and Chen, 2002) suggest that positive trade balances lead to more lenient merger reviews, as a nation's welfare is enhanced by the producer gains reaped in foreign markets. Other scholars (Landes and Posner, 1981; Ghosal, 2002) suggest that positive trade balances lead to stricter merger reviews, as consumer welfare is increasingly endangered when imports do not represent a disciplinary threat to domestic anticompetitive practices. Consequently the role of trade balance on domestic merger policy appears to reduce to the objective function (national welfare or consumer surplus) of a regulator. However, such a reduction is made more problematic once one recognizes that merger reviews are subject to political economic dynamics, the dangers of using "strategic" merger policy, and the bureaucratic discretion held by most antitrust authorities.

Accordingly, this article takes an empirical approach to shedding light on how trade balance might impact the tenor of domestic merger policy. Empirical tests based on a comprehensive panel dataset covering U.S. merger policy for manufacturing sectors at the two-digit SIC code level over the 1982–2001 period generate two principal findings. First, scant evidence exists to support U.S. antitrust

regulators practicing lenient merger reviews when an industrial sector is subject to positive trade balances. Simply put, U.S. antitrust authorities do not appear to be practicing any form of beggar-thy-neighbor merger policy. Second, empirical evidence does support U.S. antitrust regulators practicing stricter merger reviews when an industrial sector is subject to larger trade balances. Consequently the stated objective function (consumer surplus) of U.S. antitrust policy does appear to guide merger reviews even when the lure of international competitive gains is introduced. In sum, the United States does not appear to be engaging in "strategic" merger policy, and consumer welfare remains the dominant criterion when U.S. merger policy is analyzed in an open-economy setting.

The results here present some interesting extensions and implications. An obvious extension of this work would be to run similar empirical tests with medium-size and small nations (data limitations aside), as the lure of international competitive gains may prove more potent in relatively smaller nations. As already noted, a casual read through international reports (e.g., OECD, 1998) suggests that many nations do consider the international competitive gains from allowing domestic merger activity. One implication of this research pertains to the ongoing World Trade Organization (WTO) talks, where harmonization of antitrust policies is being considered. A stated rationale behind harmonization is that it would curb national antitrust authorities from engaging in lax merger reviews when the majority of the merger's deleterious effects are reaped in foreign markets. The evidence here, however, suggests that such concerns are unfounded when it comes to U.S. merger policy.

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