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GLOBALIZATION AND EXECUTIVE COMPENSATION

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ABSTRACT

This paper examines the role of globalization in the rapid increase in top incomes. Using a comprehensive data set of thousands of executives at U.S. firms from 1993-2013, we find that exports, along with technology and firm size, have contributed to rising executive compensation. Isolating changes in exports that are unrelated to the executive's talent and actions, we show that globalization has affected executive pay not only through market channels but also through non-market channels. Furthermore, exogenous export shocks raise executive compensation mostly through bonus payments in poor-governance settings, in line with the hypothesis that globalization has enhanced the executive's rent capture opportunities. Overall, these results indicate that globalization has played a more central role in the rapid growth of executive compensation and U.S. inequality than previously thought, and that rent capture is an important part of this story.

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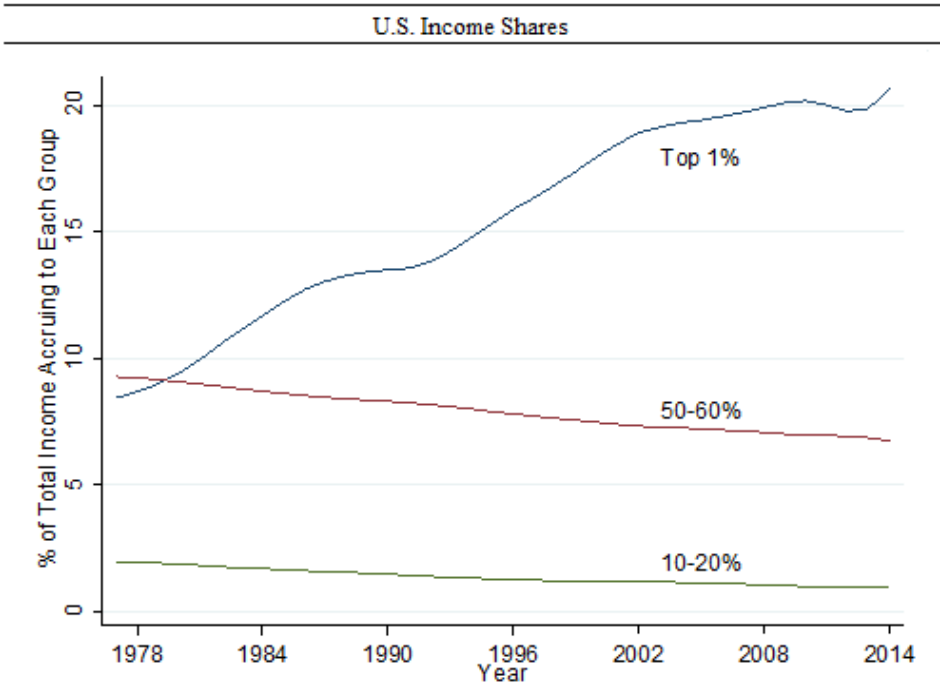
1 Introduction

"American policy has allowed the winners to keep most of the spoils of trade and has given the losers crumbs. This has exacerbated income inequality by raising the profits of big corporations and the salaries of executives and other white collar professionals while leaving blue-collar and lower-skilled workers poorer" New York Times Editorial April 2, 2016

Globalization and income inequality are currently the two most important economic issues, with dissatisfaction about both of these forces shaping elections throughout the developed world. While there is a common perception that these issues are related (as illustrated by the New York Times quote), research has tended to focus on the impact of globalization, in the form of import competition, on the low-end of the income distribution. But it is high incomes, especially the top 1% that drive U.S. inequality and top business executives figure prominently in this group:[1]

FIGURE 1



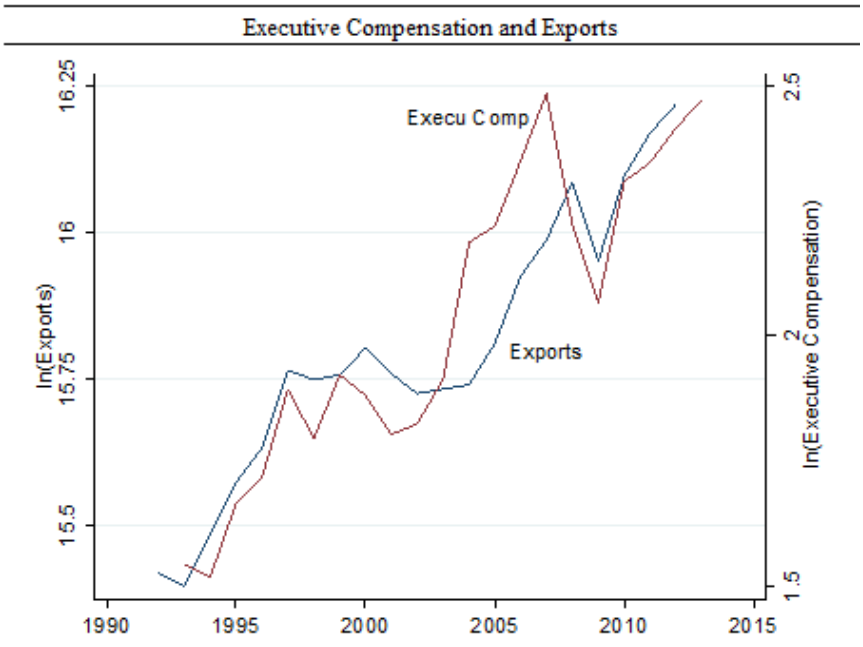
Notes: Kernel-weighted local polynomial smoothed data from World Wealth and Income Database (WID).

[1]Kaplan and Rauh (2013) show that executives are both representative for and an important part of the top 1%. Song et al. (2016) show that the top 0.1% saw particularly high pay increases, although the implications for aggregate inequality may be limited due to their relatively small number.

This paper examines the relationship between globalization and growing inequality by focusing on the incomes of top business executives.

While the income trends of Figure 1 are well-documented, the causes of this growth in inequality have remained controversial. A variety of explanations have been proposed, but globalization has rarely been a focus of this research (see the review of Kaplan and Rauh 2013). Thus, our first goal is to examine whether globalization is playing a role in the rapid increase in top incomes. A preliminary check of the data offers some support for this hypothesis. Figure 2 shows that over the last twenty five years there has been a rapid increase in both the average real executive compensation and average real exports, our preferred proxy for globalization:[2]

FIGURE 2



Notes: Average executive compensation and average exports over time (industry averages calculated first, then average across industries). Compensation data for top 5 executives is obtained for firms that span all the years in the sample from the Compustat ExecuComp data set. U.S. industry-level export data for firms in the ExecuComp data set are obtained from the U.S. Census Bureau via Schott's International Economics Resource Page (Schott 2008).

[2]Export data is more available than other measures of globalization. At the same time, exports are likely correlated with other forms of globalization and thus serve as a useful proxy for globalization overall. We show below that similar results are obtained using information on sales of U.S. owned multinational affiliates abroad (section 5.1).

To the extent that globalization matters for executive compensation, our second goal is to understand more fundamentally why exports increase executive pay. Two types of explanations can be distinguished. First, perhaps rising compensation reflects the talent and activities of the executives: they may make specific decisions that allow the firm to expand globally. Furthermore, globalization reallocates market shares from less to more productive firms (Melitz 2003, Bernard et al. 2007), which may increase the return to top talent as the size of their firms increases. Furthermore, executives at globally operating firms need to navigate the logistics of selling to many markets, deal with the complexity of setting up production stages that span numerous countries, and deal with bargaining and contractual issues in foreign countries. In short, globalization may raise the importance of top ('superstar') talent, with compensation rising accordingly (Rosen 1981).

Second, globalization might affect top incomes for reasons that are unrelated to the market talent of the executive. Perhaps the firm is expanding abroad due to sheer luck (as in Bertrand and Mullainathan 2001). For example, the firm may be part of an industry that happens to be expanding globally for reasons outside of the control of it's executives, but executives are nonetheless reaping the rewards of this fortunate turn of events. Globalization might also make it more difficult to judge executive talent. Perhaps more troubling, globalization may also increase the possibility for executives to capture rents (Bivens and Mishel 2013). The sheer size of exporting firms alone might enhance rent capture opportunities, or international transactions might make it harder for shareholders, board members, or regulatory and tax authorities to monitor executive behavior. Thus, it may not simply be luck but an increase in rent capture, perhaps associated with insider board relationships, that is driving growth in executive compensation.

The source of globalization's impact on top incomes matters because it influences society's willingness to tolerate inequality. If executive pay is largely driven by market channels in which private and social returns coincide, inequality will be less objectionable than if luck and especially rent capture loom large implying that private and social returns diverge. We examine whether globalization is influencing top incomes, and if so whether this relationship reflects returns to talent, luck, or rent capture.

We study the relationship between globalization and top incomes by studying the impact of

exports on the compensation of executives over the years 1993 to 2013. Our analysis focuses on top executives at publicly traded U.S. firms from Compustat's comprehensive ExecuComp data set. Focusing on executive compensation is informative because the majority of top income earners are executives, managers, supervisors, and financial professionals (Bakija, Cole, and Heim 2012), and the majority of the growth in top incomes has been driven by increases in salary and business income rather than growth in capital income (Piketty and Saez 2006).

In line with anecdotal evidence and Figure 2, our first finding is that exports have a significant positive impact on executive compensation. This result is robust across different specifications which account for firm fixed effects, year fixed effects, and a number of other firm and executive characteristics. Consistent with existing evidence, we find that technology (e.g., Kaplan and Rauh 2013), firm size (e.g., Gabaix and Landier 2008, Tervio 2008), and insider board relationships (e.g., Bertrand and Mullainathan 2001) are also associated with higher executive compensation.[3] We are able to simultaneously assess these various explanations in a unified empirical framework, and the fact that exports affect executive compensation even after accounting for these other factors is important.

Second, we examine whether the impact of globalization on executive compensation is driven by market talent, luck, or rent capture. Our analysis offers a unique opportunity to distinguish between these competing hypotheses by utilizing an instrumental variable approach yielding exogenous variation in exports that is orthogonal to executive and firm level characteristics. By identifying variation in compensation that is unrelated to the executive's talent and behavior, our approach isolates the returns to luck and rent capture behavior.

We identify exogenous variation in exports employing a Bartik (1991) shift-share instrument. Our instrument is constructed using presample industry-level bilateral export flows and exogenous industry-level export growth in *other* developed countries (as in Autor, Dorn, and Hanson 2013 and others). These predicted bilateral export flows are then summed to generate an exogenous source of variation in total U.S. exports for each industry and year. Importantly, this empirical strategy identifies variation in exports that is unrelated to the activities of the executive. Quantitatively, the results indicate that a 10% increase in exports leads to a 2% increase in the compensation

[3]Interestingly, we do not find strong evidence that top marginal tax rates are significantly affecting top incomes in our sample. However, we are exploiting variation in state-level tax rates, in contrast to Piketty, Saez, and Stantcheva (2014) who focus on federal rates.

of executives. Alternate instrumental variable approaches using exchange rate fluctuations and shocks in the foreign importing country are pursued in an extension and generate similar results. These instrumental-variable results indicate that globalization is increasing top incomes, and thus inequality, through channels other than market returns to talent.

We focus more carefully on non-market explanations by disentangling the luck and rent capture channels. We find that bonus payments, not regular salary, are central to the export-led increase in executive compensation. Since bonus payments are by nature relatively discretionary and conducive to rent capture, this result reinforces the role of non-market channels and suggests that rent capture is important. Furthermore, we examine whether the impact of exogenous export shocks on executive bonuses is stronger in settings that are prone to rent capture activities. We find exports lead to relatively large increases in bonuses in the presence of insider board relationships, at firms that face less scrutiny, and when the top marginal tax rate is lower and consequently the incentives for the executive to bargain over compensation are higher (Piketty, Saez, and Stantcheva 2014). This indicates that rent capture plays an important role in the relationship between globalization and top incomes.

The paper makes a number of contributions. First, early studies typically found that skill-biased technical change was more important than globalization in explaining growing inequality (Katz and Autor 1999; Feenstra and Hanson 1999). However, this literature tended to focus on the distinction between skilled and unskilled workers, which of course is not particularly well suited for studying the role of the top 1%.[4] If income inequality was driven by growth in top incomes in the 1980s (as Figure 1 suggests), perhaps economists were looking in the wrong place for the impact of trade on inequality. More recently there has been a growing consensus that trade, driven in part by the integration of China into the world economy (Krugman 2008), has played a role in rising income inequality in many high-income countries. Rising import competition has adversely affected manufacturing employment (Autor, Dorn, and Hanson 2013, Pierce and Schott 2016), led firms to upgrade their production (Bloom, Draca, and van Reenen 2016), and caused labor earnings to fall (Autor et al. 2014; Utar 2016). Our analysis complements this work on import competition by shifting the focus to the role that exports and high-income earners play in raising inequality.[5] This

[4] Autor, Dorn, and Hanson (2016) note that the impact of trade on the wage gap between high-skill and low-skill labor preoccupied inquiry in the 1990s.

[5] Hummels et al. (2014) study the impact of offshoring and exports on wages, though these authors do not focus

is important not least because high-income earners, especially the top 1%, are arguably the most important driver of income inequality (Piketty and Saez 2003, 2006).

Second, while globalization is a popular explanation for rising inequality, compared to other potential explanations it has attracted relatively little attention from researchers studying the growth in executive compensation (see Kaplan and Rauh 2013). One argument holds that globalization can be ruled out since it should be ubiquitous whereas the trends in top income shares across countries may actually differ (Alvaredo et al. 2013; Piketty, Saez, and Stantcheva 2014). Another argument contends that globalization should affect occupations differently whereas the trends in top incomes across occupations may in fact be the same (Kaplan and Rauh 2013). By moving past simple summary statistics across a handful of countries and sectors, which might be affected by a variety of idiosyncratic factors, we present one of the first rigorous empirical studies of the impact of globalization on top incomes.

Third, by analyzing the mechanism of how exports affect executive compensation, our paper is related to the literature on managers' and CEO's pay determination (see the survey by Frydman and Jenter 2010). Gabaix and Landier (2008) provide evidence for market-based effects by showing that the entire growth in CEO compensation can be explained by firm size growth in a talent assignment model. There is also evidence that the relatively high CEO pay at exporting firms is due to their large size (Ma 2015). In contrast, we show that globalization affects executive pay through firm size *and* through non-market channels. Our approach to isolate non-market channels is similar to Bertrand and Mullainathan (2001) who identify variation in firm performance that is outside the executive's control using an instrumental-variables estimation.[6] We identify environments where rent capture is more prevalent using information on insider board relationships, scrutiny, and changes in bargaining behavior related to tax rates. In contrast to Bertrand and Mullainathan (2001) and others who employ the firm's market value, we focus on export shocks to identify how exogenous changes in firm performance influence executive compensation. This is advantageous to the extent that there are mechanical reasons that link executive pay and the firm's market value, e.g. both are functions of the stock price (Himmelberg and Hubbard 2000).[7]

on top incomes.

[6] Cunat and Guadalupe (2009) present evidence that import competition increases the sensitivity of executive pay to performance, with little room for luck or rent capture effects. We also consider import competition, finding smaller or no effects on executive compensation compared to exports (see section 4).

[7] Bertrand and Mullainathan (2001) and Piketty, Saez, and Stantcheva (2014) use stock performance of other firms

The remainder of the paper proceeds as follows. Section 2 discusses the data used in this analysis and presents some descriptive statistics. Section 3 discusses the empirical specification including the instrumental-variables approach. Section 4 presents our estimates of the impact of exports on executive compensation through market and non-market channels. This section also provides evidence that rent capture plays a part in rising executive compensation. Section 5 reports a variety of important extensions and sensitivity results, while section 6 provides a concluding discussion.

2 Data

The empirical analysis utilizes executive compensation data, firm-level information, and detailed trade data from the following sources.

2.1 Executive Compensation

Compensation information of the top five executives within each Standard & Poor firm was obtained from the Compustat ExecuComp data set. To the best of our knowledge this is the most comprehensive data set on executive compensation with over 254k executive-firm-year observations spanning more than 44k executives, 3.5k U.S. firms, and the years 1992-2015. The data set has information about each executive, including their name and identifier, their company's name and identifier, and detailed compensation information based on Securities and Exchange Commission (SEC) reporting rules.

Our analysis focuses on total compensation (TDC2) which includes salary, bonuses, non-equity incentive plan compensation, stock options exercised, stock awards, deferred compensation earnings, and other types of compensation. This measure captures the total compensation realized by an executive in the given year and is similar in spirit to adjusted gross income (Kaplan and Rauh 2010). An alternate measure of total compensation (TDC1), which includes compensation awarded but not necessarily realized in the given year, is used in an extension and generates similar results. An appealing feature of the data set is that it provides detailed information on individual components of compensation, which allows us to examine how globalization differentially affects, for instance, salary and bonus compensation. All nominal compensation values are converted to real U.S. dollars

in the same industry as an exogenous source of variation, but as noted in the former paper, the stock price of other firms in the same industry may not be entirely exogenous if CEOs are able to influence these reference firms.

using the Consumer Price Index (CPI) provided by the Bureau of Labor Statistics.

We restrict the sample in two ways. First, the handful of firms that report compensation information for fewer than five executives are dropped. For firms that report compensation information for more than five executives, only the top five are included in the sample. This ensures that each firm in the sample has compensation information for exactly their five highest paid executives. Second, only firms that span all the years in the sample are included in the analysis. This alleviates concerns that exit or entry into the sample could be driving the results. The inclusion of all firms generates similar results as shown in section 5.4.

2.2 Trade Data

Detailed U.S. export and import data at the Harmonized System (HS) ten-digit product level for the years 1989-2012 comes from the U.S. Census Bureau via Schott's International Economics Resource Page (Schott 2008). These nominal trade flows are converted to real U.S. dollars using the CPI.

An appealing aspect of this data set is that the HS ten-digit trade flows are linked to the six-digit industry codes of the North American Industry Classification System (NAICS). This proves useful when merging this trade data with the ExecuComp data set which reports the six-digit NAICS industry of the executive's firm.[8] The Compustat and ExecuComp data sets do not report firm level trade. However, even if they did, the firm's decision to export is endogenous to firm characteristics, and in the absence of a credible firm-level instrumental variable industry-level exports are arguably preferable. In addition to detailed industry-level information, this data set also reports the foreign destination (or origin for imports) of these trade flows.

2.3 Other Information

The ExecuComp data set is linked to the companion Compustat data set using a unique firm-level identifier, which allows us to merge the executive compensation information with other firm-level measures in the larger Compustat data set. Most importantly, this enables us to measure insider board relationships, technology, firm size, and top marginal tax rates which may affect executive

[8] In the case of multi-industry firms, this measure reflects the primary industry of the firm. Furthermore, this ExecuComp variable is time invariant which ensures that industry switching does not lead to artificially large swings in export exposure. However, similar results are obtained in section 5.4 when the time-varying NAICS measure from Compustat is used instead.

compensation.

Insider board relationships are captured by a binary variable indicating whether any executive at the firm in a given year serves on the firm's board making compensation decisions, or serves on another company's board that has an executive serving on the firm's board. Following Feenstra and Hanson (1999), real capital expenditures are used as a proxy for technology investments. Firm size is measured by the number of workers. We prefer to proxy for firm size using employment rather than market value (e.g. Gabaix and Landier 2008) because both market value and the compensation of executives are a function of stock price, and thus a positive correlation is immediate (Himmelberg and Hubbard 2000).

Using data from the Taxsim database we measure top marginal income tax rates in the state in which the firm is headquartered. While all the U.S. executives in our data set face the same marginal federal income tax rates, they also pay state income taxes which can vary significantly across states and over time. For instance, the top marginal income tax rate has increased in California from 9.3% in 1990 to 14.1% in 2014, has remained at 0% in Texas, and has decreased from 8.5% to 5.1% in New Mexico. We examine whether top marginal state tax rates can explain part of the growth in top incomes.

Finally, we also control for a variety of individual characteristics of the executive. While the coverage of executive-level variables generally tends to be less comprehensive in the ExecuComp data set, we focus on three variables where the coverage is good and which likely matter for executive compensation. These variables are executive-level experience, whether the executive is male, and whether the executive has a doctorate degree.[9]

2.4 Descriptive Statistics

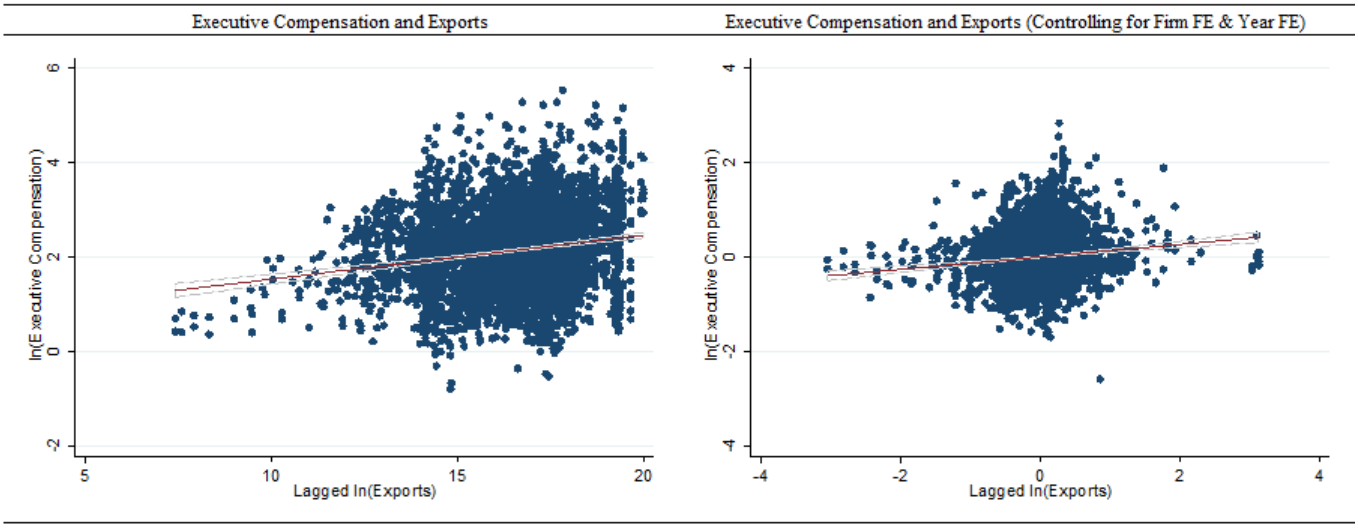
Combining these variables gives us a panel data set which includes 19,788 observations and spans 3,821 executives, 191 firms, 93 six-digit NAICS industries, and 21 years (1993-2013). Table 1 reports the summary statistics of the key compensation and independent variables used in our empirical analysis. The mean natural log of executive compensation equals 6.7, which translates into pay of over $800,000 per year (in real 1982 dollars). This consists of approximately $221,000 in salary,

[9]Experience is defined as the number of years the individual has been a top five executive at any firm in the ExecuComp data set. Section 5.4 verifies that the results are robust to other definitions of experience.

$18,000 in bonuses, and $493,000 in other compensation (which includes stock options). Note that the standard deviation of bonuses is much higher than that of the other forms of compensation, which is consistent with the idea that bonuses are more discretionary and volatile. We also see that insider board relationships occur in five percent of firms, executives have on average five and a half years of experience as a top five executive, the large majority of executives in our sample are male, and only a small fraction have a doctoral degree.

To gain further insight into the data, the left panel of Figure 3 plots the average log real executive compensation at the firm level against lagged log real exports. A significant positive relationship emerges (the dotted lines give the 95% confidence interval), which is consistent with the hypothesis that firms that are more integrated into global markets pay their executives more. However, this relationship could arise, for example, if both variables are increasing over time or because larger firms pay their executives more. To account for these and other factors, the right panel controls for both firm and year fixed effects and plots the residuals. These within-firm changes over time are the variation we exploit in our subsequent analysis, and a significant positive relationship is evident.

FIGURE 3



Notes: Average real executive compensation versus lagged real exports on the left; analogous on the right after controlling for firm fixed effects and year fixed effects.

It is encouraging that these relationships emerge in a raw cut of the data. The remainder of the paper examines whether the relationship is present in a more rigorous econometric analysis.

3 Empirical Strategy

3.1 Baseline Specification

We begin by adopting a simple framework to examine the relationship between executive compensation and exports. It is given by:

$$(1) \qquad \ln comp_{ifnt} = \beta_0 + \beta_1 \ln exp_{nt-1} + \beta_2 \ln imp_{nt-1} + \beta_3' X_{fnt-1} + \beta_4' E_{ifnt} + \gamma_f + \gamma_t + \varepsilon_{ifnt}.$$

The dependent variable is the total compensation of executive i, at firm f, in industry n, and in year t. The key independent variables of interest are logged real exports (exp) and logged real imports (imp). The vector X includes other firm-level characteristics that may influence executive compensation, including insider board relationships ($insider$), technology investment measured as real capital expenditures (cap_exp), firm size measured as employment ($empl$), and the top marginal state tax rate faced by the executive (tax_rate). The vector E includes our executive-level variables: executive experience, male, and doctorate. We follow the general practice in the literature and include firm fixed effects and year fixed effects (γ_f and γ_t, respectively).[10] Standard errors are clustered at the industry level throughout.

If growth in exports increases executive compensation then $\beta_1 > 0$. Rising imports has adversely affected low-skilled U.S. workers, as noted above, and while the implications for executives are less clear we include imports in the analysis throughout. If firms where insider board relationships are prevalent pay their executives more, then the coefficient on $insider$ will be positive. By substituting for less-skilled and complementing skilled workers, new capital expenditures may increase the returns to the relatively skilled executives. An increase in firm size might increase executive compensation due to a 'superstar' effect which need not be related to exports. Finally, lower top marginal tax rates may increase incentives for executives to bargain for higher compensation, and if so the coefficient on tax_rate will be negative

While the lag structure, the firm and year fixed effects, and the firm and executive variables

[10]Industry fixed effects are unnecessary in the baseline sample since they are completely subsumed by the firm fixed effects because no firm switches industries during this period. A subsequent robustness check uses an alternate time-varying measure of firm industry, includes both firm and industry fixed effects, and generates similar results (see Section 5.4).

alleviate endogeneity concerns, they do not eliminate them entirely. We will therefore also pursue an instrumental variable approach, discussed in the next section, to estimate the relationship between exogenous export shocks and executive compensation.

3.2 Instrumental Variable for Exports

Estimating equation (1) will provide evidence on the impact of exports on executive compensation. To the extent that exports are important, the next goal of our analysis is to understand why exports matter. One possibility is that executives who succeed at increasing sales abroad earn more because they are rewarded for their talent. Alternatively, compensation may be increasing with exports, but this export growth is not due to the actions of the executive. Our instrumental variable approach will disentangle these effects by identifying the component of exports that is unrelated to executive talent and behavior.

Our instrument draws on the insights of the influential Bartik instrumental variable approach and applies it to our setting. The standard Bartik instrument takes presample industry employment within a city and assumes this grows at the same rate as industry employment at the national level. In line with this approach, we use presample U.S. export flows for each detailed industry and allow these trade flows to grow at an exogenous rate. However, instead of using the aggregate U.S. growth rate, as suggested by Bartik's approach, we employ industry-level export growth in other developed countries. This strategy identifies variation in U.S. exports stemming from common import demand shocks for a particular industry, as well as falling trade costs in this sector. For instance, the growth of China would typically lead to an increase in exports of a particular industry from both the U.S. and from other developed countries. In addition, improvements in transportation and communication would typically make it easier to export particular goods for both the U.S. and other developed countries.[11]

Specifically, we multiply presample 1991 bilateral export flows for each detailed industry by the growth in industry exports from eight other developed countries.[12] These predicted bilateral export flows are then summed across all foreign destination markets to obtain predicted U.S. exports

[11]This approach is preferred to employing aggregate U.S. export growth because patterns of globalization are highly industry-specific..

[12]The trade data we employ is from the same set of eight high-income countries as in Autor, Dorn, and Hanson (2013), namely: Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland.

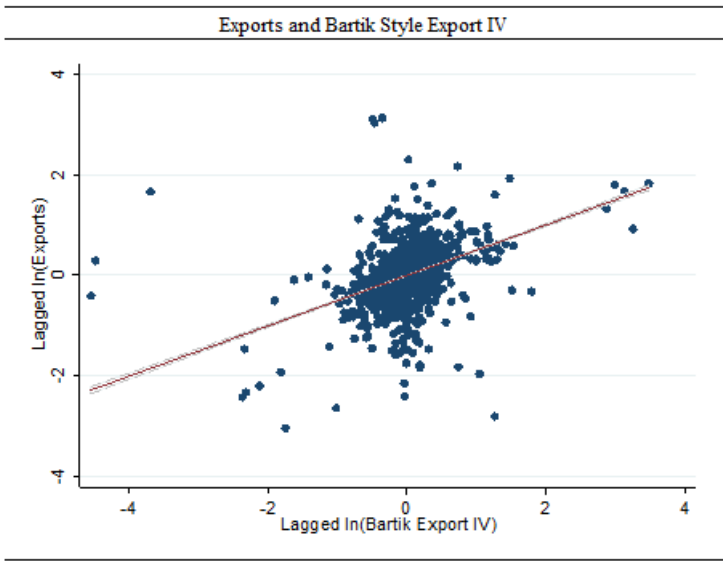
abroad in a particular industry and year:

$$bartik\_exp\_iv_{nt} = \sum_{c}(exp_{nc1991} * (1 + g_{nt})), \tag{2}$$

where g is the growth rate of exports from other developed countries from 1991 to year t in industry n, and c represents one of the top 100 U.S. trading partner countries (identified using total export sales).[13]

Figure 4 illustrates a strong positive relationship between actual exports and this instrumental variable after accounting for firm and year fixed effects:

FIGURE 4



Notes: Lagged real exports are plotted against the lagged real Bartik export IV, controlling for firm and year fixed effects.

This instrument is based on variation in predetermined bilateral industry exports and contemporaneous industry-level export growth in other developed countries. The latter picks up changes in foreign import demand and falling trade costs within a sector that are common to the U.S. and eight other developed countries. Importantly, by relying on variation that is unrelated to executive

[13]One advantage of this instrument is that it can be constructed for years in which no actual bilateral export data exist, since it only relies on presample bilateral exports and the industry level growth from other developed countries. Thus, the instrument is balanced and does not pick up extensive margin adjustments into or out of foreign destination markets which can occur in the actual data set and could be endogenous.

or firm-level characteristics, this method eliminates fluctuations in exports that are due to executive talent. Thus, if executives are rewarded solely for their ability, then executive compensation will be unresponsive to exogenous export shocks and our export instrumental-variables (IV) coefficient will be zero. On the other hand, if the export IV coefficient is significant, it will indicate that the executive is being rewarded for something other than managerial talent, that is, there is compensation for non-market reasons.

One threat to our identification strategy is that exports from the U.S. and other developed countries might be driven by common domestic export supply shocks rather than common import demand shocks. This would be problematic for our instrumental variable approach to the extent that these domestic supply shocks are correlated with executive compensation. We address this concern in three ways. First, the sample of other developed countries, used to construct the instrument, are selected in order to reduce this risk. For instance, Canada is not included in this comparison group, since it likely experiences similar export supply shocks as the U.S. Second, we explicitly control for several of the most plausible domestic supply shocks, such as scale and technological change, throughout. Third, we introduce two alternate instrumental variable strategies that address this threat to identification in other ways. The first approach constructs the instrumental variable using the percent change in the exchange rate between the U.S. and country c rather than industry-level export growth from other developed countries. The second instrument employs a gravity equation approach to identify variation in bilateral exports that is driven by changing economic conditions in the importing country. As we will show in section 5.2, these alternative instrumental variable approaches based on quite different strategies all generate similar results.

4 Results

4.1 OLS Results

Table 2 reports the OLS results from estimating equation (1). After controlling for firm fixed effects, year fixed effects, and executive-level variables, the results in column 1 indicate that executive compensation is increasing with exports. In contrast, there is no significant relationship between imports and executive compensation. While existing evidence typically shows that imports have a negative impact on low-skilled wages, our results thus far show the impact on executive compensation is not

negative.

We see that the inclusion of other firm-level characteristics does not alter this key result (columns 2-6). These additional firm measures are typically found to be important predictors of executive compensation, but their inclusion does not fundamentally alter the main export coefficient of interest. For instance, after controlling for firm size in column 4, exports still have a significant positive impact on executive compensation. The magnitude of the export coefficient does fall slightly, consistent with the hypothesis that a portion of the export effect operates through firm size, but we find that most of the impact of exports on executive compensation is unrelated to firm size. This result differs from the findings of Gabaix and Landier (2008) and Ma (2015).

The coefficients on the firm and executive variables are often significant and of the sign that one might expect. Relative to the existing literature, which tends to focus on one potential explanation at a time, an important contribution here is to provide evidence on all these explanations side-by-side (column 6). The results indicate that executive compensation is increasing with exports, insider board relationships, technology investment, and size. Furthermore, male executives and those with more experience tend to earn more. By and large, these various results are both plausible and consistent with existing research.[14] This provides support for our empirical approach and makes our new export findings all the more interesting.

For ease of comparison, column 7 reports 'beta coefficients' after first standardizing all the variables to have mean zero and standard deviation of one. The results indicate that the impact of exports is roughly comparable to that of technology investment and size, and about three times as large as that of insider boards. Thus, globalization turns out to be one of the more important drivers of executive compensation. By focusing on top incomes and exports, instead of low incomes and imports which are often the focus of previous studies, our results show that globalization is playing an important role in rising U.S. inequality.

Table 2 confirms that exports are important for executive compensation, but these results do not shed much light on the nature of this relationship. Perhaps, exports are increasing because a talented manager's decisions lead to the firm's expansion abroad, in which case higher executive compensation reflects the skill and ability of the executive. Alternatively, maybe exports are in-

[14]The finding that taxes are not significant may be due to our reliance on state tax variation or the sample of firms in our analysis. However, the interaction of exports and tax rates generates significant and interesting results, as we will show later.

creasing because of greater global demand for the firm's products which in turn increases executive compensation. Thus, the executive is being rewarded for a fortunate turn of events which is unrelated to his or her own talent and actions. The subsequent instrumental variable analysis seeks to disentangle these potential explanations.

4.2 IV Results

In this section our estimates are based on export shocks driven by changes in foreign import demand and other exogenous factors. By construction, these shocks are not related to the executive's talent and actions which means that this empirical approach will not capture labor market returns to skill. If non-market factors are unimportant in determining executive compensation, then the export IV coefficient will be insignificant. Conversely, if exogenous export shocks affect compensation, this is evidence that non-market factors matter for executive compensation. The non-market forces that we will focus on are luck, or being in the right place at the right time, and rent capture.

Table 3 reports the first-stage of our instrumental-variable results. Consistent with the scatter plot shown in Figure 4, we see that the instrument is a strong predictor of actual export flows. The coefficient on the export instrument is positive and changes little after the inclusion of additional variables. Furthermore, the F-statistic on the excluded instrument is well above 10 in all specifications which indicates a relatively strong first stage.

Table 4 reports the corresponding second-stage instrumental-variable results. With only exports and imports included in column 1, the coefficient on the former is 0.3 while the coefficient on the latter is essentially zero. Adding other variables such as technological investments and size reduces the export coefficient somewhat, but throughout we estimate a positive impact of export shocks on executive compensation (see columns 2-6). Since by construction the fluctuations in exports are not driven by decisions taken by the executive, this provides evidence that executives are rewarded for non-market factors. Notice that the other variables have a similar effect on executive compensation as in the OLS analysis above. We have also explored an analogous instrumental-variable approach on the import side, but there is little evidence that import shocks significantly affect executive compensation (reported in Table 13).

Quantitatively, we find that a 10% export shock leads to a 2% pay increase for executives (column 6). The analogous OLS coefficient (Table 2, column 6) indicates that a 10% increase in

exports translates to a 1% increase in executive compensation. Given the standard errors of the IV and the OLS estimates, it is hard to draw definitive conclusions about the relative magnitudes of the market and non-market channels. Furthermore, the IV approach eliminates not only the endogenous market returns to executive talent but also possible measurement error and omitted variable bias, which complicate attempts to interpret the difference between the OLS and IV estimates.

4.3 Type of Compensation

Our data set has detailed individual compensation measures which allows us to examine whether the impact of exports has differential effects on various components of executive pay. Specifically, we focus on salary, bonuses, and other forms of compensation, which includes stock options, incentive plans, signing bonuses, severance payments, 401k contributions, etc.[15]

Given the inherently unpredictable nature of exogenous export shocks one may expect a heterogeneous effect of exports on different components of compensation. For instance, export shocks may primarily effect compensation that is more short-run in nature, such as non-salary compensation or bonuses, while having a limited impact on more permanent sources of income, such as salary. If so, random export shocks will tilt the composition of compensation from relatively structured forms of payments such as salary towards less structured elements such as bonuses. At the same time, a less structured compensation environment may also be conducive to rent capture behavior because it is likely that rent capture is facilitated by a discretionary, less rules-based compensation regime.

Table 5 reports the IV results which identify the impact of exogenous export shocks on different components of executive pay. For ease of comparison, column 1 re-reports the earlier baseline results which use total compensation as the dependent variable, while columns 2-4 decompose compensation into salary, bonuses, and all other compensation. We see that exogenous export shocks have no impact on salary (column 2), which is not surprising because salary compensation is relatively stable over time and thus should be less responsive to unanticipated shocks. Furthermore, other types of compensation (column 4) is also not responsive to export shocks. However, in column 3 we find that exogenous export shocks have a strong, significant, and positive impact on bonuses. These results are consistent with the hypothesis that export shocks should have a stronger impact on short run

[15] While these individual compensation measures have more coverage and consistency issues than the aggregate measure, TDC2, employed in the main analysis, we have verified that the influence of these issues on our results is limited.

and more flexible forms of compensation.

The coefficients on the other firm-level variables in Table 5 are also of interest. Less-volatile structural changes in the firm, such as the adoption of new technology and changes in firm size, have no significant impact on bonuses even though they affect other forms of compensation. We also see that insider board relationships raise executive compensation in the form of bonuses, but have no impact on salary or other forms of compensation. This is consistent with the idea that bonuses are more susceptible to rent capture. Additionally, there is evidence that bonuses are declining with imports, although this result tends not to be robust to other specifications or instrumentation (as shown in Table 13). Overall, these contrasting results indicate that various forces affect the compensation of executives through different but intuitive channels.

We also examine the impact of general exports, rather than just exogenous exports shocks, on different types of executive compensation. This can be thought of as a quasi placebo test. While exogenous export shocks do primarily affect bonuses (see Table 5), the impact of exports more generally may not be concentrated in bonuses. For instance, variation in exports driven by executive talent could in principle just as easily affect salary as bonuses. Table 6 reports OLS results that identify the general impact of exports on different types of executive compensation. Notice that exports do not have a statistically different impact on the various components of executive compensation. Reassuringly, of the six export coefficients reported in columns 2-4 of Tables 5 and 6, the only one that is statistically significant is precisely the one where we expect our story to be strongest (i.e. the response of bonuses to exogenous export shocks).

The key result from this analysis of individual forms of compensation is that the impact of export shocks on executive compensation comes primarily from relatively unstructured forms of non-salary compensation, in particular bonuses. Given their short-term adjustable nature, it makes sense that the component of compensation most affected by exogenous export shocks is bonuses. At the same time, less structured forms of compensation may also leave more room for bargaining and rent capture as opposed to sheer luck. It is thus natural to ask whether the impact of globalization varies with the governance environment.

4.4 Rent Capture

Distinguishing luck from rent capture is important because it can inform attitudes towards rising executive compensation. Returns to luck may be less objectionable compared to executives actively trying to capture rents associated with unforeseen global shocks. We disentangle these explanations by examining whether the observed relationship between export shocks and compensation is more pronounced in scenarios where rent capture is more likely. In particular, we examine whether insider board relationships increases the compensation gains of executives in the presence of shocks to exporting. It is well-known that one purpose of insider board relationships is to raise the compensation of the key executives involved. Furthermore, we ask whether the impact of export shocks on executive compensation varies with the tax rate executives pay. Recent research has emphasized that as top marginal tax rates fall executives stand to gain more from aggressive bargaining behavior (Piketty, Saez, and Stantcheva 2014). Finally, it may be that rent capture opportunities are less prevalent at firms that face greater scrutiny from regulators, shareholders, and the media. We proxy for scrutiny using an indicator variable that identifies whether the firm is part of the S&P 500 or the S&P Midcap groups.[16] To formally test these ideas, we interact exogenous export shocks with our insider board, top marginal tax rate, and S&P 500-Mid variables.

We have seen above that much of the influence of export shocks on compensation is related to bonus payments (Table 5), so we start with this specification and re-report these results in column 1 of Table 7. Columns 2-5 instruments for both exports and the export interaction terms, using the interaction of the export instrumental variable and the respective rent capture variables (i.e. insider board relationship, top tax rate, and S&P 500-Mid). In column 2, we see that export shocks increase bonuses particularly strongly in the presence of insider board relationships. While on average a 10% export shock raises bonuses by 6%, if insider board relationships exist then bonuses increase by 9% for the same export shock, or by about 50% more. This is further evidence that the increase in executive compensation through globalization occurs in part through non-market channels.

Our tax rate results are shown in column 3. The coefficient on the tax-export interaction is -0.2, indicating that the impact of export shocks on bonuses is higher, the lower the top marginal tax rate the executive faces. This is consistent with the idea that executives bargain more aggressively

[16]These groups contain the largest S&P firms based on market capitalization.

when tax rates are lower, as proposed by Piketty, Saez, and Stantcheva (2014). More broadly the result points to the importance of changing social norms for executive behavior. Quantitatively, the effect appears to be non-negligible. For instance, California's 9.3% top marginal tax rate at the beginning of our sample implies that a 10% export shock increases bonus payments by 3.2%, while their 14.1% tax rate at the end of our sample implies that a 10% export shock increases bonus payments by only 2.3%.

Column 4 shows that executive bonuses are less responsive to exogenous exports shocks at firms that are part of the S&P 500-Mid group. In other words, executives at smaller firms, who face less scrutiny, receive significantly larger bonuses in response to export shocks. Finally, column 5 shows that the insider board, tax, and S&P size effects are essentially orthogonal to each other and all still significant, which reinforces the overall quantitative importance of the rent capture and bargaining effects.

We have argued that our three measures (insider board, top tax rate, and S&P designation) are successfully capturing a poor governance environment where rent capture is possible. To confirm that these measures are in fact reflecting rent capture and not some other factor, we pursue another quasi placebo test. Specifically, we examine the impact of exogenous export shocks on an alternate type of compensation (e.g. salaries) in different rent capture environments. Since salaries are rarely altered in the short term, one would expect that the governance environment in which an executive operates matters little for his or her salary in the presence of an export shock. The results in Table 8 follow the same structure as in Table 7 except that now the dependent variable is salary rather than bonuses. As expected, the interaction terms are insignificant in Table 8 which indicates that the governance environment has no bearing on the relationship between export shocks and salary. In additional OLS results (not reported but available upon request), we find that the general effect of exports on salary is not sensitive to the governance environment either.

In sum, the governance environment in which the executive operates matters most strongly for relatively unstructured forms of compensation, such as bonuses, when the change in exports is by construction unrelated to the executive's actions. This provides evidence that globalization has increased executive compensation through non-market channels.

5 Extensions

5.1 Executive - Worker Compensation Ratio

Our main results indicate that exogenous export shocks increase executive compensation. However, exports may also increase the wages of other workers within the firm. To gain insight into within-firm inequality, we also explore whether exogenous export shocks increase the executive to worker pay ratio within the firm.

Since U.S. firms are not required to report non-executive compensation, Compustat does not have a direct measure of wages. We therefore define average wages within the firm as labor expenses per employee, following Bertrand and Mullainathan (1999). Unfortunately, the coverage of the labor expense variable in Compustat is relatively poor. In cases where this variable is missing, we use average labor expenses per employee at other similar firms within the same narrowly defined industry and year.[17] This approach takes advantage of the fact that firms in the same year and within a narrowly defined industry likely pay similar wages. Of course, this is not a perfect method, which is why these results appear as an extension.[18]

Table 9 reports the IV results using the executive to worker compensation ratio as the dependent variable. The coefficient on exports is positive, significant, and actually larger in magnitude than the analogous results using executive compensation reported in Table 4. This suggests that executives are relatively more successful at reaping the rewards of exogenous export shocks than the average worker. As we see in columns 2-6 of Table 9, this finding is not sensitive to the inclusion of other firm-level variables, often found to be important predictors of executive compensation. Not surprisingly, capital expenditures in column 6 has a strong positive impact on the executive-worker pay gap, which suggests that skill-biased technical change is contributing to growing inequality within the firm. Furthermore, increases in top marginal income tax rates tends to reduce the executive-worker pay gap, as one would expect. Overall, these results support our baseline findings and provide direct evidence that exports have led to a significant increase in within-firm inequality.

[17] Specifically, if firm-level average wage is missing then we use average wages at other firms within the same six-digit NAICS industry and year. If this industry-level wage is also missing, then we use average wage at the five-digit NAICS industry and so forth.

[18] Note that the results could be biased towards zero because individual executive pay is also included in the average worker compensation in the denominator.

5.2 Alternate IV Approaches

This section examines the robustness of our results to two alternate methods of generating exogenous export variation. While these two additional approaches are conceptually distinct from our baseline instrument, all three strategies share the common goal of identifying exogenous variation in exports that is uncorrelated with executive or firm behavior.

5.2.1 Exchange Rate Export IV

Our first alternate instrumental-variables approach uses exchange rate variation to construct an export instrument along the lines of Bertrand and Mullainathan (2001) and Bertrand (2004). This approach exploits two sources of variation in the data. First, there is substantial variation in exchange rates over time, defined as the number of units of the foreign importing country's currency per U.S. dollar.[19] Second, based on presample bilateral export flows, some industries will be more exposed to exchange rate fluctuations in a particular foreign country than other industries.

More specifically, the instrument is constructed in an analogous manner to the baseline instrument outlined in equation 2. Again we use presample 1991 U.S. bilateral export flows in industry n and to foreign country c.[20] The difference is that now we multiply presample export flows by the percent change in the exchange rate between 1991 and year t. Then we sum across trade partners, to generate an industry-specific export instrument that relies on variation in exchange rates that affect some industries more than others based on presample export flows.

The potential benefit of this instrumental-variable approach is that exchange rate fluctuations may be harder for firms and executives to anticipate compared to foreign import demand shocks. However, the drawback is that exchange rates can, of course, change in response to domestic U.S. conditions, which in turn may be correlated with executive compensation.

With these considerations in mind, column 1 of Table 10 reports the IV results using this exchange rate export instrument. The first stage results, reported in the bottom panel, show that

[19] Nominal exchange rate data is obtained from the World Bank (WB) for numerous countries spanning the years 1990-2015. Unfortunately, the World Bank does not report exchange rates for EU countries post 1999, so instead for these EU countries we use the OECD exchange rate data that spans the entire sample. For non-EU countries that are present in both the WB and the OECD data sets, the exchange rate data are identical. The results are similar if just the WB data is used instead.

[20] Similar to the baseline IV, we focus on the top 100 U.S. trading partner countries and can construct the instrument for years in which no actual bilateral export data exists. Thus, this instrument is balanced and does not capture extensive margin adjustments into or out of foreign destination markets which could be endogenous.

the coefficient on the exchange rate instrument is negative and significant. As expected, an increase in the exchange rate, reported as the foreign currency per U.S. dollar, makes U.S. goods more expensive abroad and thus reduces exports. The second stage results, reported in the upper panel, show that exogenous export shocks driven by exchange rate fluctuations have a significant positive impact on executive compensation. The magnitude of this effect is similar to our earlier results. Thus, our baseline findings are confirmed using a different identification strategy that relies on exchange rate fluctuations.

5.2.2 Gravity Export IV

Our second alternate instrumental-variable approach uses bilateral export flows and insights from the gravity equation to identify an exogenous source of variation in exports. Specifically, variation in bilateral exports driven by changing economic conditions in the foreign importing country and time-invariant geographic characteristics is identified. Then the predicted bilateral export flows are summed across all of the U.S. trading partners within that industry. This generates an instrument for industry-specific exports that is by construction exogenous to domestic conditions in the U.S. (including executive compensation).

This approach builds on the insights of Frankel and Romer (1999) and applies these principles to industry-level exports, as in Blanchard and Olney (2016). The ability to use the same foreign shock to separately identify industry variation in exports implicitly takes advantage of two important sources of variation. First, the U.S. does not export all goods to all countries. Consequently, it is possible that a shock in a foreign country could affect exports in one industry but not another. Second, the impact of the shock could be very different across industries. For instance, economic growth in one foreign country may increase U.S. exports of semiconductors more quickly than it would increase U.S. exports of asphalt shingles.

More specifically, U.S. exports for each six-digit NAICS industry are regressed on real GDP in the foreign country and on geographic characteristics in the following manner:

$$ln(x_{nct}) = \alpha_1 ln(rgdp_{ct}) + \alpha_2 ln(dist_c) + \alpha_3 contig_c + \varepsilon_{ct}, \tag{3}$$

where x_{nct} is the bilateral U.S. export flows in industry n to foreign country c in year t. The

key independent variable is the real GDP ($rgdp$) in foreign country c in year t.[21] In addition, the specification includes the population-weighted distance ($dist$) between the U.S. and the foreign country and an indicator for whether they share a border ($contig$). These time-invariant factors will not affect changes in executive compensation over time and thus do not pose a problem for the exclusion restriction.

To eliminate extensive margin entry or exit into foreign markets that could be driven by endogenous factors, the bilateral pair sample of foreign countries is restricted in two ways to reduce the sporadic exports of goods to some small foreign countries. First, as before, the sample only includes the top 100 foreign trading partner countries. Second, within each industry, the sample only includes foreign countries to which the U.S. exports a positive amount in all years.[22] This ensures that the set of foreign trade partners does not change over time within an industry.[23]

Equation (3) is separately estimated for each six-digit NAICS industry. Reporting results from all of these individual regressions is impractical given the large number of industries but Table 11 reports findings from a few industries. Two things are noteworthy. First, the number of observations varies by good, which indicates that the U.S. exports different goods to different sets of countries. Thus an import demand shock in one particular foreign country will affect U.S. exports of a particular good x but may not affect exports of another good y. Second, Table 11 shows that there is variation across industries in terms of how responsive they are to changing economic conditions in the foreign country. For instance, exports in some industries, such as soft drinks, asphalt shingles, and small arms, are relatively less responsive to growth in GDP in the foreign country. However, the exports of other types of goods, such as pharmaceuticals, semiconductors, and medical instruments, increase substantially in response to foreign GDP growth. Table 11 confirms that there is variation across industries in terms of how they respond to foreign import demand shocks.

The fitted values from each of these industry-specific regressions are captured and used to construct the instrument. Note, by construction these fitted values are not a function of conditions in the U.S. Since the unit of observation in the main analysis (equation 1) is at the industry-year

[21] GDP data comes from the World Bank.

[22] Unlike the baseline and exchange rate instruments, this approach does not make out-of-sample predictions and thus it is necessary to first balance the sample.

[23] However, the set of foreign countries can vary across industries. For instance, one industry may export to 98 foreign countries in all years but another may only export to 81 foreign countries in all years. This variation is not problematic, and is actually, useful for the subsequent analysis.

level, the final step is to sum these fitted values across all of the U.S.'s trading partner countries. The unlogged bilateral fitted values are summed to construct an instrument that varies by industry and year:

$$gravity\_exp\_iv_{nt} = \sum_{c} e^{\widehat{\alpha_1} ln(rgdp_{ct}) + \widehat{\alpha_2} ln(dist_{ct}) + \widehat{\alpha_3} contig_c} \tag{4}$$

Like the baseline instrumental-variables strategy, the goal of this approach is to construct an instrument that identifies an exogenous source of variation in exports. However, unlike the baseline instrument, this method does not rely on exports from other developed countries to identify import demand shocks and changes in sector-level trade costs. Instead this approach specifically identifies the shock in the foreign country, using variation in foreign GDP, that is driving the change in demand for U.S. exports.

The instrumental-variables results using the gravity instrument are reported in column 2 of Table 10. The first stage results reported in the bottom panel show that the gravity IV has a significant positive impact on actual export flows and the first stage F-statistic is around 10. The second stage results indicate that exogenous export shocks have a positive and significant impact on executive compensation. This result is similar in magnitude to both the baseline and exchange rate instruments. Overall, these results are reassuring since they indicate that our key findings hold using a variety of instrumental-variable approaches that identify different sources of exogenous variation in export flows.

5.3 Foreign Affiliate Sales

Given the availability of detailed trade data, we have thus far focused on exports (and imports) as our preferred measures of globalization. However, it would be useful to examine other components of globalization, such as foreign direct investment, that could potentially influence executive compensation. This section investigates the link between foreign affiliate sales and executive compensation.

Our analysis utilizes firm-level information on foreign affiliate sales available in the Compustat data set. Unfortunately this data has some limitations. First, it is only available for the years post 2009 which severely limits the sample to only four years (2010-2013). Second, bilateral information

on the countries in which these affiliate sales occur is unavailable. Thus, it is not possible to construct an analogous instrumental variable for foreign direct investment as we have done for exports. Third, while the data allow domestic and foreign affiliate sales to be identified, Compustat and the underlying SEC filings do not separately measure export sales.

With these caveats in mind, Table 12 reports the relationship between foreign affiliates sales and executive compensation. The results in column 1 indicate that foreign affiliate sales have a positive and significant impact on executive compensation. Interestingly, we see in columns 2-6 that the inclusion of firm-level variables, including domestic sales, does not alter this result.[24] Not surprisingly, domestic sales also has a positive and significant impact on executive compensation, although interestingly its point estimate is smaller than that of foreign sales. Due to the data and other limitations, these results should be interpreted with caution. However, they provide another piece of evidence that globalization is indeed playing a role in the growth of executive compensation.

5.4 Other Sensitivity Results

Table 13 reports a variety of robustness checks that test the sensitivity of our results. Total compensation realized by an executive in a given year (TDC2) has been used as our dependent variable. However, the ExecuComp data set also provides an alternate measure of total compensation (TDC1), which includes compensation awarded but not necessarily realized in the given year using a Black-Scholes calculation.[25] Despite the differences in how these compensation variables are calculated, column 1 of Table 13 shows that the export coefficient remains virtually unchanged when using this alternate measure of total executive compensation.

Data on additional firm-level characteristics are obtained from the Compustat data set and linked to the ExecuComp data using a unique firm-level identifier. Column 2 includes firm sales, assets, and costs respectively. These firm-level variables turn out to be insignificant, due to their high correlation with employment. When they are included individually *in lieu* of employment, each is significant. More importantly, after conditioning on firm size and other measures of performance, exports still have a significant impact on executive compensation. Thus, it is not simply the fact

[24]The insider board relationship variable is absorbed by the firm fixed effects due to a lack of variation over this limited time frame.

[25]See Kaplan and Rauh (2010) for a discussion of how TDC2 and TDC1 differ and why TDC2 is a better measure of adjusted gross income.

that exports pick up a mechanical relationship driven by positive firm performance. Reassuringly, including these additional variables does not alter the main findings, which may not be surprising since our instrumental variable approach identifies variation in exports that is exogenous to firm and executive characteristics.

The baseline analysis only includes firms that span the entire 21 years of the sample. This is a conservative approach that reduces concerns about selection into or out of the sample, but it discards a lot of data. Instead, columns 3 and 4 include all firms. Column 3 includes the top tax rate variable while column 4 excludes it given that the headquarter location variable does not have full coverage (the number of observations increases from 37k to 60k when the tax rate variable is excluded). The results show that exports remain an important predictor of top incomes when the full sample of firms is used.

Column 5 relies on a time-varying measure of the firm's NAICS industry (from Compustat) rather than using the time-invariant NAICS code provided in the ExecuComp data set, which is used in the baseline analysis. The benefit of using this time-varying industry measure is that it accounts for the possibility that a firm's primary industry may change over the sample.[26] The downside is that potentially small changes in a firm's composition of production, which shift it from one NAICS industry to another, could lead to large changes in the firm's exposure to industry-level exports. This will generate noisy swings in exports in the data set, when in fact the firm's switch from one NAICS industry to another may represent a rather small readjustment in production activities. Column 5 uses this time-varying measure of the firm's industry, includes industry fixed effects, and shows that the results remain unchanged.

While the anticipated impact of imports on executive compensation is unclear, we have nonetheless controlled for imports throughout. As a further check that our results are not sensitive to imports, we also constructed an analogous Bartik style instrumental variable for imports. Specifically, this import IV is constructed using presample bilateral import flows and the growth in industry-level imports in other developed countries. Column 6 of Table 13 reports results after instrumenting for both exports and imports. Reassuringly, the coefficient on exports remains positive and significant. In contrast, exogenous import shocks do not have a significant impact on executive compensation.

While insider boards is our preferred measure of rent capture environments, we also explored

[26] However, the majority of firms in the sample do not switch NAICS industries.

using an alternate rent measure. Specifically, we defined the binary variable *rent* to equal one if the firm's stock price fell but average executive compensation at the firm rose in a given year. The results in column 7 indicate that defining rent capture in this way also generates a significant positive coefficient.

Our preferred measure of experience is the number of years the executive has been a top 5 executive at any firm in the ExecuComp data set. Column 8 also controls for the number of years the executive has worked at the firm and the number of years the executive has been the CEO of the firm. Despite data coverage limitations, the results indicate that all three experience measures matter. While we are cautious about over-interpreting these results, these findings suggest that executive pay is more sensitive to general executive experience than firm-level experience. Within the firm, experience as the CEO is, not surprisingly, more important for compensation than simply total experience at the firm.

Finally, we explore the dynamic nature of our data set by exploiting changes in the composition of the top 5 highest paid executives within a firm over time. The results in column 9 indicate that executives earn significantly lower pay when there is a change in leadership within the firm.[27] This may reflect the fact that the new executive(s) likely earns less than the seasoned executive(s) they are replacing, or that the executive turnover itself is a reflection of declining fortunes within the firm which have implications for compensation. Importantly, the inclusion of either more detailed experience measures (column 8) or executive turnover (column 9) does not alter the observed relationship between exports and executive compensation.

Overall, we conclude from the various results in Table 13 that our key findings are robust to a variety of different empirical specifications, the inclusion of additional firm and executive level variables, and alternate samples of firms.

6 Conclusion

We construct a panel data set spanning thousands of executives working at hundreds of major U.S. firms over the last twenty years to examine the influence of globalization on the rising compensation of business executives. Our analysis generates a number of key new findings. First, globalization

[27] Executive Turnover is an indicator variable identifying whether any of the top 5 executives have changed from the previous year.

is playing a more important role in inequality, through the growth in top incomes, than previously thought. We show that rising exports, along with insider boards, technology investments, and larger firm scale, has a positive impact on executive compensation. Importantly, executive compensation is rising with exports beyond simply the increase in firm size necessary to accommodate these exports, and quantitatively, we find that globalization is comparable in importance to technical change. While past studies have focused on imports or dismissed globalization's impact on top incomes based on simple cross-country or cross-occupation statistics, we show using a comprehensive data set and a rigorous empirical analysis that exports have played an important role in the recent growth of executive compensation.

Second, this finding is not simply reflecting the fact that talented, high-ability executives are needed for expanding abroad and thus the invisible hand of the market ensures that they are more highly compensated. Our instrumental-variable results demonstrate that executive compensation increases with export shocks that are by construction unrelated to the talent and actions of the executive. We show that a 10% export shock leads to a 2% increase in compensation for these U.S. executives.

Third, we find that exogenous export shocks primarily affect discretionary, less-structured forms of compensation, especially bonuses, whereas they do not change other forms of compensation. In addition, the increase in executive pay in the presence of export shocks is larger in poor governance environments where rent capture is prevalent. Executives do not seem to be simply in the right place at the right time, but rather their rising compensation due to globalization comes about in part through the executive's (visible) hand pursuing non-market reward strategies.

Our finding that recent globalization trends have increased U.S. inequality by disproportionately raising top incomes represents an important step forward. At the same time, our results might help to explain the gap between the public perception of globalization and economic research. In recent elections throughout the developed world, anger about globalization is leading to a populist resurgence. To the extent that top income earners disproportionately benefit from globalization through the exploitation of poor governance settings, these attitudes are understandable. However, these findings should not be interpreted as a rationale for protectionist policies, since globalization has likely generated large increases in the standard of living. The key question for policy makers is to devise ways to address the distributional implications of globalization, such as those identified

in this paper, without compromising aggregate welfare gains.

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TABLE 1
Summary Statistics

	Obs	Mean	Std. Dev.	Min	Max
Compensation Variables:					
ln (Executive Compensation)	19,788	6.7	1.1	-0.8	12.0
ln (Salary)	19,788	5.4	0.6	-0.8	7.6
ln (Bonus)	19,788	2.9	2.9	-0.8	10.1
ln (Other Compensation)	19,788	6.2	1.6	-0.8	12.0
Independent Variables:					
ln $(\text{Exports})_{t-1}$	19,788	16.4	1.8	7.4	20.0
ln $(\text{Imports})_{t-1}$	19,788	16.7	2.1	0.0	21.3
Insider Board	19,788	0.05	0.21	0.00	1.00
ln $(\text{Capital Expenditure})_{t-1}$	19,788	13.5	1.7	7.1	18.8
ln $(\text{Employment})_{t-1}$	19,788	9.1	1.5	3.2	13.1
ln $(\text{Top Tax Rate})_{t-1}$	19,788	1.3	1.5	-2.3	2.7
Experience	19,788	5.4	4.1	1.0	26.0
Male	19,788	0.97	0.18	0.00	1.00
Dr.	19,788	0.03	0.17	0.00	1.00

TABLE 2
The Impact of Exports on Executive Compensation (OLS)

	ln (Executive Compensation)						Beta Coeff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln (Exports)$_{t-1}$	0.105**	0.101**	0.074**	0.089**	0.103**	0.071**	0.113**
	[0.044]	[0.043]	[0.033]	[0.040]	[0.044]	[0.033]	[0.053]
ln (Imports)$_{t-1}$	0.059	0.058	0.048	0.047	0.059	0.045	0.088
	[0.045]	[0.044]	[0.040]	[0.044]	[0.045]	[0.040]	[0.078]
Insider Board		0.184**				0.177**	0.034**
		[0.080]				[0.073]	[0.014]
ln (Capital Expenditure)$_{t-1}$			0.129***			0.092***	0.145***
			[0.026]			[0.028]	[0.044]
ln (Employment)$_{t-1}$				0.155***		0.073*	0.101*
				[0.033]		[0.039]	[0.054]
ln (Top Tax Rate)$_{t-1}$					-0.157	-0.136	-0.183
					[0.163]	[0.157]	[0.210]
Experience	0.090***	0.090***	0.089***	0.089***	0.090***	0.089***	0.329***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.013]
Male	0.160***	0.164***	0.148***	0.147***	0.159***	0.149***	0.025***
	[0.046]	[0.046]	[0.044]	[0.043]	[0.046]	[0.044]	[0.007]
Dr.	0.088	0.089	0.091	0.095	0.088	0.095	0.015
	[0.058]	[0.059]	[0.059]	[0.057]	[0.058]	[0.058]	[0.009]
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,053	20,053	19,843	19,993	20,053	19,788	19,788
R-squared	0.574	0.575	0.580	0.578	0.574	0.581	0.581

Notes: The dependent variable is the ln of total compensation (TDC2) of the executive. Exports and Imports are measured at the 6-digit NAICS level. Insider Board, Capital Expenditure, and Employment are measured at the firm level. Experience, Male, and Dr. are measured at the executive level. The top marginal tax rate in the state in which the firm is headquartered is obtained from Taxsim. Column 7 reports the Beta Coefficients after standardizing all variables to have a mean of 0 and a standard deviation of 1. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 3
The First Stage IV Results

	ln (Exports)$_{t-1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
ln (Export IV)$_{t-1}$	0.410***	0.408***	0.385***	0.403***	0.408***	0.381***
	[0.108]	[0.108]	[0.098]	[0.105]	[0.106]	[0.098]
ln (Imports)$_{t-1}$	0.162	0.162	0.155	0.158	0.163	0.156
	[0.136]	[0.136]	[0.136]	[0.137]	[0.137]	[0.136]
Insider Board		0.078				0.066
		[0.076]				[0.076]
ln (Capital Expenditure)$_{t-1}$			0.066*			0.071*
			[0.038]			[0.043]
ln (Employment)$_{t-1}$				0.055*		-0.016
				[0.033]		[0.030]
ln (Top Tax Rate)$_{t-1}$					-0.339**	-0.313*
					[0.172]	[0.173]
Executive Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,738	19,738	19,528	19,678	19,738	19,473
F-Stat on Instrument	14.5	14.2	15.4	14.7	14.8	15.2

Notes: Dependent variable is log exports lagged by one year. Estimation by OLS. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 4
The Impact of Exports on Executive Compensation (IV)

	ln (Executive Compensation)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln (Exports)$_{t-1}$	0.300***	0.292***	0.214***	0.257***	0.298***	0.211***
	[0.081]	[0.080]	[0.072]	[0.079]	[0.081]	[0.077]
ln (Imports)$_{t-1}$	0.014	0.015	0.019	0.010	0.014	0.015
	[0.031]	[0.031]	[0.027]	[0.031]	[0.031]	[0.029]
Insider Board		0.136				0.137*
		[0.084]				[0.076]
ln (Capital Expenditure)$_{t-1}$			0.108***			0.067***
			[0.023]			[0.025]
ln (Employment)$_{t-1}$				0.139***		0.083**
				[0.032]		[0.038]
ln (Top Tax Rate)$_{t-1}$					-0.089	-0.095
					[0.173]	[0.166]
Executive Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,738	19,738	19,528	19,678	19,738	19,473
R-squared	0.567	0.568	0.576	0.572	0.567	0.577
F-Stat on Instrument	14.5	14.2	15.4	14.7	14.8	15.2

Notes: Second stage of two-stage least squares regression. The dependent variable is the ln of total compensation (TDC2) of the executive. Exports and Imports are measured at the 6-digit NAICS level. Insider Board, Capital Expenditure, and Employment are measured at the firm level. Experience, Male, and Dr. are measured at the executive level. The top marginal tax rate in the state in which the firm is headquartered is obtained from Taxsim. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 5
The Impact of Exports on Alternate Compensation Measures (IV)

	Total Comp.	Salary	Bonus	Other
	(1)	(2)	(3)	(4)
ln (Exports)$_{t-1}$	0.211***	-0.030	0.595**	0.127
	[0.077]	[0.020]	[0.272]	[0.125]
ln (Imports)$_{t-1}$	0.015	0.019*	-0.162***	-0.027
	[0.029]	[0.010]	[0.060]	[0.021]
Insider Board	0.137*	0.001	0.458**	0.004
	[0.076]	[0.023]	[0.222]	[0.104]
ln (Capital Expenditure)$_{t-1}$	0.067***	0.011	-0.070	0.110**
	[0.025]	[0.007]	[0.090]	[0.043]
ln (Employment)$_{t-1}$	0.083**	0.131***	0.159	0.251***
	[0.038]	[0.014]	[0.113]	[0.050]
ln (Top Tax Rate)$_{t-1}$	-0.095	-0.026	-0.112	-0.450**
	[0.166]	[0.079]	[0.586]	[0.196]
Executive Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	19,473	19,475	19,475	19,475
R-squared	0.577	0.502	0.575	0.535
F-Stat on Instrument	15.2	15.2	15.2	15.2

Notes: Second stage of two-stage least squares regression. Column 1 re-reports the baseline results from column 6 of Table 4. Columns 2-4 use salary, bonuses, and other compensation as the dependent variable (in logs). Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 6
The Impact of Exports on Alternate Compensation Measures (OLS)

	Total Comp.	Salary	Bonus	Other
	(1)	(2)	(3)	(4)
ln (Exports)$_{t-1}$	0.071**	-0.006	0.107	0.012
	[0.033]	[0.010]	[0.154]	[0.031]
ln (Imports)$_{t-1}$	0.045	0.017*	-0.067	0.002
	[0.040]	[0.009]	[0.087]	[0.018]
Insider Board	0.177**	-0.020	0.507**	0.042
	[0.073]	[0.030]	[0.215]	[0.100]
ln (Capital Expenditure)$_{t-1}$	0.092***	0.007	-0.001	0.134***
	[0.028]	[0.007]	[0.100]	[0.040]
ln (Employment)$_{t-1}$	0.073*	0.137***	0.147	0.231***
	[0.039]	[0.014]	[0.118]	[0.051]
ln (Top Tax Rate)$_{t-1}$	-0.136	-0.016	-0.276	-0.502***
	[0.157]	[0.077]	[0.545]	[0.185]
Executive Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	19,788	19,790	19,790	19,790
R-squared	0.581	0.481	0.584	0.538

Notes: Estimation by OLS. Column 1 re-reports results from column 6 of Table 2. Columns 2-4 use salary, bonuses, and other compensation as the dependent variable (in logs). Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 7
The Impact of Exports on Bonuses in Different Governance Environments (IV)

	ln (Bonuses)				
	(1)	(2)	(3)	(4)	(5)
ln (Exports)$_{t-1}$	0.595**	0.594**	0.794***	0.911**	1.221***
	[0.272]	[0.267]	[0.182]	[0.357]	[0.275]
ln (Imports)$_{t-1}$	-0.162***	-0.168***	-0.173**	-0.110	-0.113
	[0.060]	[0.060]	[0.068]	[0.078]	[0.092]
Insider Board	0.458**	-6.460**	0.478**	0.474**	-4.836**
	[0.222]	[2.590]	[0.210]	[0.209]	[2.332]
ln (Capital Expenditure)$_{t-1}$	-0.070	-0.065	-0.130	-0.038	-0.091
	[0.090]	[0.091]	[0.083]	[0.099]	[0.090]
ln (Employment)$_{t-1}$	0.159	0.155	0.202*	0.158	0.204*
	[0.113]	[0.114]	[0.115]	[0.112]	[0.115]
ln (Top Tax Rate)$_{t-1}$	-0.112	-0.144	4.401***	-0.129	4.914***
	[0.586]	[0.575]	[1.137]	[0.572]	[1.197]
ln (Exports)$_{t-1}$*Insider Board		0.334***			0.258**
		[0.122]			[0.111]
ln (Exports)$_{t-1}$*ln (Top Tax Rate)$_{t-1}$			-0.212***		-0.238***
			[0.047]		[0.050]
ln (Exports)$_{t-1}$*ln (S&P 500-Mid)$_{t-1}$				-0.503*	-0.640*
				[0.302]	[0.329]
Executive Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	19,475	19,475	19,475	19,475	19,475
R-squared	0.575	0.576	0.576	0.575	0.578
F-Stat on Instrument	28	15, 4062	24, 135	9, 36	13, 3697, 122, 41

Notes: Second stage of two-stage least squares regression. Dependent variable in all columns is the natural log of bonuses. Exports and the export interactions are instrumented throughout using the Bartik style IV and the interaction of this IV and the variable of interest. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 8

The Impact of Exports on Non-Discretionary Compensation in Different Governance Environments (IV)

	ln (Salary)				
	(1)	(2)	(3)	(4)	(5)
ln (Exports)$_{t-1}$	-0.030	-0.030	-0.029	-0.038	-0.038
	[0.020]	[0.020]	[0.018]	[0.028]	[0.029]
ln (Imports)$_{t-1}$	0.019*	0.019*	0.019*	0.018	0.018
	[0.010]	[0.010]	[0.011]	[0.011]	[0.011]
Insider Board	0.001	-0.109	0.002	0.001	-0.116
	[0.023]	[0.273]	[0.023]	[0.023]	[0.282]
ln (Capital Expenditure)$_{t-1}$	0.011	0.011	0.010	0.010	0.010
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
ln (Employment)$_{t-1}$	0.131***	0.131***	0.131***	0.131***	0.131***
	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]
ln (Top Tax Rate)$_{t-1}$	-0.026	-0.026	-0.003	-0.025	-0.018
	[0.079]	[0.079]	[0.146]	[0.079]	[0.156]
ln (Exports)$_{t-1}$*Insider Board		0.005			0.006
		[0.013]			[0.014]
ln (Exports)$_{t-1}$*ln (Top Tax Rate)$_{t-1}$			-0.001		0.000
			[0.005]		[0.005]
ln (Exports)$_{t-1}$*ln (S&P 500-Mid)$_{t-1}$				0.013	0.014
				[0.035]	[0.037]
Executive Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	19,475	19,475	19,475	19,475	19,475
R-squared	0.502	0.502	0.502	0.502	0.502
F-Stat on Instrument	15.2	15, 4062	24, 135	9, 36	13, 3697, 122, 41

Notes: Second stage of two-stage least squares regression. Dependent variable is the log of executive salary. Exports and the export interactions are instrumented throughout using the Bartik style IV and the interaction of this IV with the variable of interest. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 9
The Impact of Exports on Executive to Average Worker Compensation Ratio

	ln (Execu / Worker Compensation)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln (Exports)$_{t-1}$	0.616***	0.614***	0.436**	0.575***	0.607***	0.414**
	[0.207]	[0.209]	[0.212]	[0.214]	[0.207]	[0.206]
ln (Imports)$_{t-1}$	-0.134*	-0.133*	-0.123*	-0.135*	-0.131*	-0.114*
	[0.072]	[0.072]	[0.068]	[0.072]	[0.071]	[0.068]
Insider Board		0.04				0.038
		[0.099]				[0.082]
ln (Capital Expenditure)$_{t-1}$			0.231***			0.294***
			[0.041]			[0.070]
ln (Employment)$_{t-1}$				0.126***		-0.138*
				[0.037]		[0.083]
ln (Top Tax Rate)$_{t-1}$					-0.520*	-0.537*
					[0.310]	[0.287]
Executive Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,633	19,633	19,423	19,573	19,633	19,368
R-squared	0.399	0.399	0.421	0.403	0.401	0.423
F-Stat on Instrument	14.5	14.2	15.4	14.7	14.8	15.2

Notes: Second stage of two-stage least squares regression. Dependent variable is the log of the ratio of total executive compensation (TDC2) to average worker compensation at the firm. Average worker compensation is measured by the firm's labor expenses per employee, and if this data is missing, by the detailed industry average compensation per employee. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 10
The Impact of Exports on Executive Compensation (Alternate Export Instruments)

	Exchange Rate IV	Gravity IV
	(1)	(2)
ln (Exports)$_{t-1}$	0.270**	0.238**
	[0.135]	[0.114]
ln (Imports)$_{t-1}$	0.005	-0.001
	[0.035]	[0.117]
Insider Board	0.157**	0.165**
	[0.076]	[0.076]
ln (Capital Expenditure)$_{t-1}$	0.066***	0.070***
	[0.025]	[0.023]
ln (Employment)$_{t-1}$	0.080**	0.079**
	[0.035]	[0.037]
ln (Top Tax Rate)$_{t-1}$	-0.063	-0.076
	[0.179]	[0.168]
Executive Controls	Yes	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
Observations	19,788	19,578
R-squared	0.575	0.573
First Stage Results:		
ln (Exchange Rate IV)$_{t-1}$	-0.067***	
	[0.021]	
ln (Gravity IV)$_{t-1}$		0.593***
		[0.184]
F-Stat on Instrument	9.8	10.4

Notes: First and second stage results of two-stage least squares regression. Dependent variable is log executive compensation (TCD2). Column 1 uses an instrument that is constructed using exchange rate fluctuations and presample bilateral export flows. Column 2 uses an instrument that identifies, using the gravity equation, shocks to bilateral export flows driven by conditions in the foreign importing country. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 11
The Construction of Gravity Instrument using U.S. Bilateral Trade Data

	ln (Exports)					
NAICS Code:	312111	324122	325411	332994	334413	339112
NAICS Description:	Soft Drinks	Asphalt Shingles	Pharmaceutical & Medicine	Small Arms	Semiconductors	Surgical & Medical Instruments
	(1)	(2)	(3)	(4)	(5)	(6)
ln (Real GDP)	0.247***	0.257***	1.171***	0.610***	1.270***	1.128***
	[0.045]	[0.033]	[0.019]	[0.023]	[0.026]	[0.016]
ln (Distance)	-0.814***	-0.597***	-1.033***	0.159*	-0.320**	-1.323***
	[0.125]	[0.110]	[0.069]	[0.087]	[0.124]	[0.067]
Contiguous	3.118***	2.824***	-0.456***	1.685***	2.303***	-0.135
	[0.281]	[0.274]	[0.129]	[0.221]	[0.198]	[0.120]
Observations	798	819	1,533	1,302	1,722	1,743
R-squared	0.316	0.329	0.730	0.448	0.572	0.700

Notes: The dependent variable is the ln of exports in that particular six-digit NAICS industry. Estimation by OLS. Only six industries are reported in this table due to space constraints but this same exercise is repeated for all of the six-digit NAICS industries in the sample. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 12
The Impact of Foreign Affiliate Sales on Executive Compensation

	ln (Executive Compensation)					
	(1)	(2)	(3)	(4)	(5)	(6)
ln (Foreign Sales)$_{t-1}$	0.039**	0.045***	0.039**	0.039**	0.037*	0.048***
	[0.018]	[0.015]	[0.018]	[0.019]	[0.019]	[0.012]
ln (Capital Expenditure)$_{t-1}$		-0.065				-0.123***
		[0.045]				[0.038]
ln (Employment)$_{t-1}$			0.001			-0.021
			[0.106]			[0.108]
ln (Top Tax Rate)$_{t-1}$				-0.045		-0.102
				[0.159]		[0.160]
ln (Domestic Sales)$_{t-1}$					0.033***	0.046***
					[0.006]	[0.011]
Executive Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,220	3,220	3,210	3,220	3,220	3,210
R-squared	0.660	0.661	0.665	0.660	0.661	0.667

Notes: Dependent variable is log total executive compensation. Estimation by OLS. Included years are 2010-2013, for which information on foreign affiliate sales is available. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 13
The Impact of Exports on Executive Compensation - Sensitivity Analysis

	Alt Execu Comp	Firm Controls	Full Sample	Full Sample	$NAICS_t$	Import IV	Rent	Experience	Turnover
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln (Exports)$_{t-1}$	0.192***	0.190**	0.192***	0.240***	0.302**	0.370**	0.212***	0.221***	0.214***
	[0.057]	[0.077]	[0.045]	[0.054]	[0.134]	[0.178]	[0.080]	[0.079]	[0.078]
ln (Imports)$_{t-1}$	-0.007	0.016	0.003	0.004	-0.024	-0.286	0.014	0.014	0.015
	[0.022]	[0.029]	[0.023]	[0.019]	[0.066]	[0.211]	[0.030]	[0.029]	[0.030]
Insider Board	0.075	0.125*	0.088	0.088**	0.172**	0.138*		0.124	0.137*
	[0.055]	[0.075]	[0.064]	[0.044]	[0.076]	[0.077]		[0.081]	[0.076]
ln (Capital Expenditure)$_{t-1}$	0.079***	0.051*	0.050**	0.049***	0.040	0.065**	0.067**	0.065**	0.067***
	[0.021]	[0.029]	[0.020]	[0.016]	[0.030]	[0.027]	[0.027]	[0.027]	[0.025]
ln (Employment)$_{t-1}$	0.137***	0.006	0.101***	0.083***	0.096**	0.108**	0.080**	0.085**	0.086**
	[0.030]	[0.060]	[0.038]	[0.029]	[0.040]	[0.047]	[0.040]	[0.037]	[0.038]
ln (Top Tax Rate)$_{t-1}$	-0.229*	-0.102	0.073		0.015	0.006	-0.086	-0.061	-0.093
	[0.136]	[0.164]	[0.136]		[0.189]	[0.205]	[0.166]	[0.169]	[0.166]
Experience	0.068***	0.089***	0.088***	0.093***	0.088***	0.088***	0.089***	0.065***	0.088***
	[0.003]	[0.003]	[0.002]	[0.002]	[0.003]	[0.004]	[0.003]	[0.004]	[0.003]
Male	0.142***	0.153***	0.157***	0.169***	0.141***	0.148***	0.153***	0.141***	0.153***
	[0.043]	[0.045]	[0.031]	[0.021]	[0.042]	[0.046]	[0.044]	[0.044]	[0.044]
Dr.	0.162**	0.093	0.166***	0.085**	0.094	0.114**	0.093	-0.027	0.094
	[0.066]	[0.058]	[0.052]	[0.043]	[0.060]	[0.058]	[0.059]	[0.082]	[0.060]
ln (Sales)$_{t-1}$		0.105							
		[0.088]							
ln (Assets)$_{t-1}$		0.002							
		[0.060]							
ln (Costs)$_{t-1}$		-0.004							
		[0.084]							
Rent							0.118***		
							[0.017]		
Firm Experience								0.003*	
								[0.002]	
Firm-CEO Experience								0.043***	
								[0.004]	
Executive Turnover									-0.041**
									[0.019]
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	Yes	No	No	No	No
Observations	19,010	19,468	37,109	59,552	18,408	19,473	19,473	19,473	19,473
R-squared	0.596	0.578	0.548	0.550	0.579	0.546	0.578	0.600	0.577
F-Stat on Instrument	15.3	13.1	22.1	27.9	13.0	11.2, 10.8	15.6	15.2	15.1

Notes: Second stage of two-stage least squares regression. Column 1 uses an alternate executive total compensation measure (TDC1). Column 2 includes additional firm-level controls. Columns 3 and 4 include all firms rather than just those that span the entire sample. Column 5 uses a time-varying measure of the firm's NAICS industry (which has implications for export and import exposure). Column 6 instruments for both exports and imports. Column 7 uses a different measure of rent-seeking behavior that equals one in a given year if the firm's stock price fell while the average compensation of executives rose. Column 8 controls for the number of years the executive has been at the firm and the number of years the executive has been CEO at the firm, in addtion to the baseline experience measure capturing the number of years the executive has worked for any S&P firm. Finally, column 9 includes an indicator variable identifying whether the composition of the firms top 5 highest paid executives has changed from the previous year. Robust standard errors clustered at the industry level in brackets. *** p<0.01, ** p<0.05, * p<0.1.