**Contagion by Connection: Trade Networks and Autocratic Diffusion**

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## Abstract

Democratic diffusion, the spread of democracy among states, is well-documented while autocratic diffusion remains less explored. Existing research on democratic diffusion through trade assumes a trend of continued democratization of states in the global trade system. However, contrary to expectations of democratic diffusion theory, autocratization is happening at record levels. I argue that the structures of trade networks that states participate in can create conditions conducive to the diffusion of autocracy, offering a network-based explanation to the rise in the number of autocracies. I examine trade relations between 1962 and 2017 to propose a novel dataset of global trade networks constructed through the Leiden algorithm that captures the interactions between states and their regimes. This proposed dataset would not only advance our understanding of autocratic diffusion, but also contribute to the growing trend in research of a shift away from dyadic frameworks towards multilateral analyses. By analyzing these networks, I demonstrate that trade relationships among states with autocracies can foster the spread of autocracy, undermining the predictions of democratic diffusion theories. My capstone highlights the need to reconsider the mechanisms by which political regimes influence one another and offers a new approach to understanding the global dynamics of regime diffusion.

## Introduction

Diffusion is the process through which political norms, models, and institutions can spread through certain networks. Democratic diffusion theory argues that an increase in democracy in a country can spread and diffuse to other neighboring countries. Therefore, aside from domestic and foreign causes, countries could become democracies, or at least democratize, simply through "capturing" democratization in their neighbors. This diffusion has been observed empirically: between the years of 1991 and 2001, a country whose neighbor's Polity IV score increased by one would itself experience a larger increase in polity score than a country whose neighbor did not undergo a one point increase in polity score (Leeson and Dean 2009). This effect of democratic diffusion is also argued to occur through non-geographical linkages as well, including trade.

Beyond liberal theories that discuss the coevolution of trade and democracy and their effects in maintaining peace, empirical research has shown that in the era of globalization, increased exposure to trade and financial markets can lead to democratization in less developed countries where welfare spending is present (Rudra 2005). Also, economic liberalization and openness to trade is known to advance democracy (Fish and Choudhry 2007; López-Córdova and Meissner 2008). Furthermore, bilateral trade agreements can lead to democratization, especially if the trade partner is a democracy (Manger and Pickup 2016). Trade globalization has begun to reach its upper bounds, and an effect of that is trade between nearly all states present in the international system (Palan et al. 2021, 1876). This would imply that many, if not all, countries trade with democracies.

With this in mind, it would be expected to see countries continue to democratize in line with the theories and research discussed. However, what is actually observed is a large amount of autocratization, even among states that participate heavily in the global trade network. The European Union, itself a promoter of democratic norms to the rest of Europe (Börzel and Lebanidze 2017), had nearly 20% of its member states experience autocratization over the past decade. This is not isolated to the EU, but is indicative of a larger observed wave of autocratization in the modern world; 33 countries, a record number, that are home to 36% of the world population autocratized in 2021 (Boese et al. 2022).

This puzzle, the contradiction between what research and theory tells us and what is being observed in terms of trade and democratization, could possibly be addressed by autocratic diffusion theory. In a similar vein to democratic diffusion theory, autocratic diffusion theory argues that autocracy can spread from country to country as well. If true, the theory would argue that we observe this large amount of autocratization because autocracy diffuses in networks like international trade, and "outweighs" the effect of democratic diffusion. Tangential research could be seen as support for this idea: trade with autocratic regimes is known to promote illiberal norms in certain cases. For example, members of the Belt-and-Road Initiative have increased political alignment and relations with China (Lu et al. 2021), and trade with China and Russia is known to lead to the adoption of autocratic norms through the transfer of information (Flonk

2021) and endorsement/patronage of autocratic government actors (Bae 2022), even in democratic states.

Applying the effects observed in trade with China and Russia to trade with all autocratic regimes is unwise, given the great power status of those two states even in the Liberal International Order compared to other autocratic regimes which might not hold the same influence. This raises the question of if autocracy can really diffuse through trade and explain the rise of autocracy and shift away from democracy in some states, and if the theory can be applied to autocratic states that aren't the two discussed above. There is also the issue of applicability of autocratic diffusion through trade to the modern understanding of trade. Recent literature has changed focus from bilateral trade dyads to trade networks made up of multiple states trading with each other more than others to reflect the international system in which all states trade with each other. These issues lead me to the research question my capstone seeks to explore in detail: When does autocracy diffuse through trade networks?

## Literature Review

Though understanding diffusion theory is key in starting to formulate an answer to my capstone's area of focus, the literature on autocratic diffusion is not only sparse but also focused more on theoretical aspects than empirical research. As noted by Ambrosio and Tolstrup (2019), this theoretical focus has left some of the possible networks that autocracy can diffuse through, such as trade, underexplored compared to the literature on democratic diffusion. The concepts of autocratic diffusion and democratic diffusion imply that the two phenomena inherently counteract each other: democratic diffusion sees states shift away from autocracy and towards democracy and vice versa for autocratic diffusion. As such the networks identified by the literature through which democracy diffuses could also be applied to autocratic diffusion, but due to the difference in causal mechanisms behind the two phenomena this is unlikely.

For democratic diffusion, Elkink (2011) puts it succinctly: "Democracy is Contagious". There is a historical focus on geographical linkages, although there has been a shift towards a more abstract conceptualization of democratic diffusion to see how it occurs in other networks. To begin, it is well-documented that democratization can happen in spatial clusters (Gleditsch and Ward 2006; O'Loughlin et al. 1998), and empirical research supports the idea that democratization in one country can spread to its neighbors (Leeson and Dean 2009). Historical examples such as the Spring of Nations in the early 19th century as well as the Third Wave of democracy in the late 20th century show the geographical pathways of democratic diffusion (Gunitsky 2018).

Aside from geographical proximity, democratic diffusion can be facilitated through international organizations. IOs can promote democratic development among member states through pressure (Pevehouse 2002) and democratic development can originate from democracies within IOs as seen in the example of Indonesia promoting democracy in Southeast Asia through ASEAN (Nanda and Permata 2023). By increasing economic openness and the level of

international trade of their members, regional organizations can also help democracy spread among member states (Kim and Heo 2018). As mentioned in the puzzle, there is a large body of research that discusses the role of trade ties in inducing democracy as well.

The key causal mechanisms of democratic diffusion are based on a down-to-top perspective. Change tends to be induced from domestic audience costs and pressure on incumbent governments (Koesel and Bunce 2013). In a similar vein, related factors such as shared history, culture, or languages cause any shift towards democracy in a country to be more visually pronounced to citizens in its neighbors and affects public opinions on democratic institutions (Kyritsis et al. 2022). Networks such as geographical proximity act as vectors that aid attitudes promoting democracy to spread through informal communication between citizens of different countries (Elkink 2011).

While not yet demonstrated empirically, scholars do theorize that autocracy can diffuse regionally: Kurt Weyland, for example, identifies the Blue Waves in Latin America during the 70s as an example of autocratic diffusion (2016) and the current Conservative Wave in the same region supports the idea that autocratic diffusion can happen through spatial networks as well. However, though geographical proximity facilitates this diffusion, it is not the only pathway through which autocracy is known to spread.

Autocratic diffusion can occur through IO membership. Being a member of an IO predominantly made up of autocrats helps stabilize autocratic rule, and increases in the level of autocracy in an IO is associated with decreases in political liberalization among member states (Cottiero and Haggard 2023). However, it is unknown if autocracy can spread through trade to the extent that democracy does. Past research has shown that trade with China can stabilize autocratic rule due to insulation from democratic pressures (Bader 2015), but this doesn't exactly tell us if trade can induce autocratization, and there is the same issue from the puzzle in that trade with China cannot be generalized to trade with autocracies as a whole.

Like democratic diffusion, the literature on autocratic diffusion highlights the potential for autocratization to spread through various networks, but the mechanisms differ significantly. Autocracy is primarily implemented by elites, in contrast to the bottom-to-top model in democratic diffusion where citizens pressure their leaders. Autocracy spreads from elites in powerful autocratic states to other countries with the goal of expanding their sphere of influence and challenging the promotion of democracy (Weyland 2019, Gunitsky 2019; Kneuer and Demmelhuber 2016). Similar to the image of a nucleus, these states act as hubs through which illiberal governance models, strategies, and support are transmitted.

Although there is a gap in what is known about autocratic diffusion and trade, it is not enough to see if autocracy can spread through trade dyads. The increased number of papers that look at trade from a multilateral network perspective challenges the generalizability of a prospective paper that looks only at bilateral trade and autocratic diffusion. This shift in thinking supports the idea that states are not only influenced and influence their direct trade partners, but their overall influence is determined by their roles in larger networks. Network theory has been applied to trade to examine the effects of network structures on outcomes such as susceptibility

to COVID (Antonietti et al. 2022), vulnerability to water shortages (Lee et al. 2016) and diffusion of technological information and norms (Ferrier et al. 2016; Zhang and Duan 2020). While the latter studies show how network theory can be used to model diffusion processes, little attention has been paid to how political models might similarly diffuse. This creates an opportunity to extend network theory into the subject of autocratization.

Overall, the literature shows that democracy and autocracy can diffuse through international networks like geographical proximity, membership in international organizations, and for democracy, trade. Despite the similarity in networks, the two phenomena have different causal mechanisms. Democratic diffusion mostly occurs through norms being spread among citizens in different states and those attitudes creating audience costs that put pressure on government actors, though some cases see pressure coming from foreign actors. In comparison, autocratic diffusion is driven primarily by elites with norms being spread by other autocratic states in order to increase their spheres of influence. Unfortunately, the literature is uneven; autocratic diffusion is largely understudied in comparison to democratic diffusion, especially in contexts such as trade. The work that does look at autocratization through trade focuses on actors like China and Russia and at a bilateral, not multilateral, level which challenges their generalizability. In order to address this, my capstone attempts to look at autocratic diffusion through the lens of network theory and offers a new perspective on the role of trade network structure in the spread of autocracy.

## Theory and Hypotheses

Traditional frameworks of international trade use bilateral dyadic relationships between states to examine the effects of trade on other variables. While this framework has benefits such as offering a smaller level of analysis, looking only at bilateral trade fails to address the complexity of global trade systems where bilateral trade is present among all states. By focusing on relationships in isolation, this framework ignores how connections between states can interact with each other and confounds the various effects of dyadic trade. Network theory in comparison allows for an analysis of how states are positioned within global trade systems. The arrangement of states in a network and structures of the network itself can shape outcomes (Antonietti et al. 2022).

As such, I choose to use a network-level perspective to model autocratic diffusion not only due to a lack of such research on the topic but because analyzing networks allows for an understanding of the cumulative effects of trade with many states. In response to the research question of when autocracy diffuses through trade networks, I argue that the structure of trade networks affects the propensity for autocracy to diffuse within those networks.

Following the present literature on autocratic diffusion, implementation of autocracy is driven by elite decisions. For this paper, I use the definition of elites from Osei (2018): “Persons who are able, by virtue of their strategic positions in powerful organizations and movements, to affect political outcomes regularly and substantially.” All states have some form of a political

elite group, and the decisions of that elite group are shaped not only by domestic factors (Miller and Curry 2024), but also by their country's participation in the international system. Economic factors, for example, can drive elite decision making (Amodio et al. 2022). Trade networks are a key part of the international system that can influence how elites affect political outcomes as they offer repeated interaction with other international actors, exposing states and their elites to a variety of political norms and institutional practices. Elites may respond not just to a single trade partner but to broader trends within networks themselves.

I begin with the premise that elites seek to maintain power and stability in their domestic environments and adapt their strategies in response to external pressures and factors. I don't argue that elites might prefer one form of governance over another inherently; there are many reasons as to why elites might prefer democracy to autocracy (Baliamoune-Lutz 2020) and vice versa (Kailitz and Stockemer 2017). When their states participate in trade networks, elites may encounter various political models that influence and shape their decisions. Networks dominated by democratic states may constrain autocratization and induce democracy by raising political and material costs of deviating from entrenched liberal norms. In contrast, networks with autocracies may expose elites to political models of centralized governance, patronage, and political illiberalism which can appear attractive or viable. This can lead to an elite emulation mechanism in which continued exposure to autocratic models and isolation from non-autocratic ones results in norm internalization and observational learning of governance styles. As such, the structure of a trade network can condition the behaviors of elites in member states. In terms of network structure, I argue that the main determinants of diffusion are the centrality of autocratic states as well as the overall exposure to autocratic states within the network. The presence of these factors can induce elite emulation of autocratic models (especially of states seen as central and prestigious), increase the spread of norms from autocracies, and isolate member states from democratic pressures.

When the most central and influential state in a trade network is autocratic, other member states are more frequently exposed to their political models. In a similar vein to Weyland's (2019) writings on autocratic spheres of influence, centrality affords autocratic states to normalize their styles of governance to other states through example and exchange. Not only are such central states more economically connected, but they may also have more prestige and hold asymmetric power and influence within trade relationships. This could lead to autocratic diffusion in two ways: central autocratic states can gain leverage over other member states that presumably wish to maintain trade ties in a network either through direct coercion or intentional entrepreneurship of norms, and political models can become more familiar and potentially legitimate to other member states simply through consistent engagement with central autocratic regimes. This leads me to my first hypothesis:

**H1:** A trade network with a central and influential autocratic state will experience autocratic diffusion more than a network without one.

Beyond centrality, I also argue that the proportion of trade a state conducts with autocratic regimes may also shape susceptibility to autocratic influence. With a larger number of authoritarian trade partners, elites may have more opportunities to emulate political models. Furthermore, a higher proportion of such trade partners can also reduce the leverage and pressures from democratic actors or institutions. In contrast, when democracies represent a smaller share of a country's trade network, those pressures become easier to ignore, and elite alignment with illiberal models may become more attractive or viable. As such, my second hypothesis is as follows:

**H2:** A trade network with a higher proportion of overall trade ties to autocratic states will experience autocratic diffusion more than a network with a lower proportion.

While exposure through autocracies through increased trade ties is expected to increase the potential for autocratic diffusion, I also want to take into account the possibility of networks that see significant trade with both democracies and autocracies. In such situations, it could be that there is less insulation from democratic pressure and an increase in exposure to democratic norms. Following the mechanisms of democratic diffusion, consistent exposure to trade with democracies can act as a pathway for norms to spread to citizens who might impose domestic audience costs on elites and leaders. Research on the effects of EU trade in post-soviet states have theorized that trade with the EU aided democratization by counteracting the autocratizing effects of Russian trade (Lankina et al. 2016). To test this, my final hypothesis is thus:

**H3:** Trade networks that have trade ties to both democracies and autocracies will experience less autocratic diffusion than a network that has more trade ties to autocracies than democracies.

My theory proposes that autocratic diffusion can occur through the structural features of trade networks, as they can shape elite decisions through exposure to political models and norms. Through a focus on centrality and embeddedness of autocratic states within networks, my framework goes beyond bilateral trade models to properly observe systematic pressures and effects that influence elite behavior as well as political outcomes. This reflects an effort to answer when autocracy diffuses overall, rather than just when autocratization occurs within states.

## Research Design

To comprehensively test my hypotheses of how network structure affects the propensity for autocratic diffusion among member states, I lay out the following research design. To begin, I use a unit-of-analysis of the network-year, that is a unique trade network in a given year, and a sample of all trade networks in the international system between the years of 1962 and 2017.

Those dates are drawn from the starting year of the UN Comtrade Database (2024) and the second to last-year of the Polity V dataset (Marshall and Gurr 2020), both of which will be used to operationalize my variables. To conduct a quantitative analysis of trade network structures, I first construct a novel dataset of all trade networks in the dates discussed above. This is done by using Comtrade data, which shows bilateral trade flows between all UN member states, to construct an adjacency matrix representing the global trade system, and then performing the Leiden algorithm on the adjacency matrix as proposed by Traag et al. (2019) to identify trade networks with members more densely connected to each other than other states in the global trade system. Using the Leiden algorithm allows for the identification of trade networks based on actual observed trade intensity rather than arbitrary geographical or institutional boundaries. This helps capture environments where sustained exposure and influence are most likely to occur as they reflect the dynamic and evolving patterns of trade interactions. The algorithm will be performed using the leiden package in R (Kelly 2023) and each network will be assigned a given identification letter and the year it was found. Although identification numbers will be retained through each year of observations for the sake of simplicity, a Network A in 2004 won't be the exact same as a Network A in 2005 as it is rare that the membership of trade networks remains stable and identical over time.

The Leiden algorithm itself works by iteratively refining distinct networks through a three-phase process which includes the local moving of nodes, refinement of communities, and continued aggregation based on refined networks. This guarantees trade networks that are not only locally-optimal but also structurally cohesive. This is common practice within network theory-focused research: Antonietti et al. (2022) used this method in the past with the precursor to the Leiden algorithm on a sample of fifty-five states to identify 22 unique trade networks in 2019 and 21 unique networks in 2021. Assuming an average of fifteen to twenty networks in a given year, the sample of time from 1962 to 2017 allows for more than enough observations to achieve statistical power of 80% to detect effect sizes similar to those found in Leeson and Dean (2009). Figure 1 below shows a simplified version of the process by which I will construct this novel dataset: the adjacency matrix made from Comtrade data is visualized in graph-form and two trade networks are found through the Leiden algorithm. Figure 2, in comparison, shows five of the communities in 2019 identified in Antonietti et al. (2022) as an example of possible outputted trade networks.

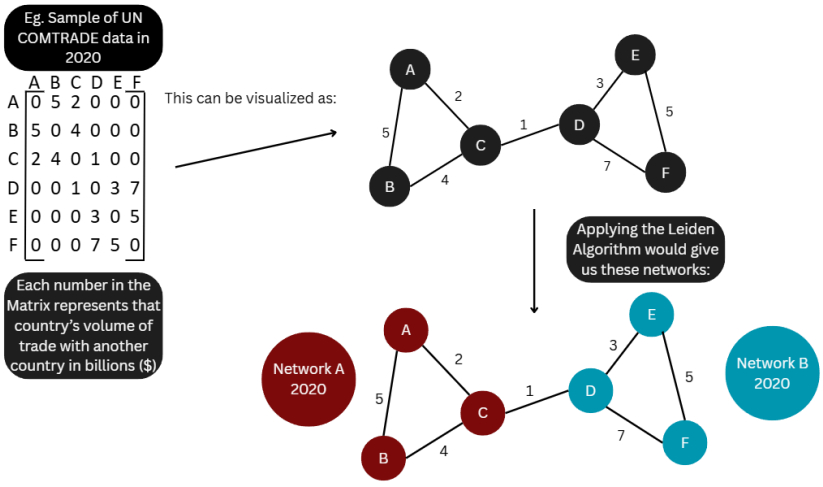

*Figure 1. Example of the creation of the dataset's observations in 2020*

| | Size | Members |
|---|---|---|
| Community 1 | 6 | AUS CAN JPN NZL PHL USA |
| Community 2 | 14 | BEL CHE CZE DEU ESP GBR HUN |
| | | IRL ITA MDA NLD PRT ROU SVK |
| Community 3 | 5 | BIH HRV MNE SRB SVN |
| Community 4 | 7 | DNK EST FIN LTU LVA NOR SWE |
| Community 5 | 3 | ARM AZE GEO |

*Figure 2. Sample of five trade networks in 2019 from Antonietti et al. (2022)*

My dependent variable, autocratic diffusion, is operationalized as a count variable measuring the number of countries within a network that experienced a decrease in Polity score in the following year. For example, a network in 2014 might be given a DV measure of five if five of its countries saw a decrease in polity score (compared to 2014) in 2015. Data for this will be gathered from the Polity5 dataset, which assigns such Polity scores to all major, independent states (those that had a population greater than 500,000 in the most recent year) in the global system over the period 1800-2018. Since I am leading my DV measurement by one year, the timeframe of my dataset stops at 2017.

By using a count variable rather than a binary variable that measures if a country autocratized in a network, this analysis better captures the concept of diffusion among states. It should be noted though, that this current operationalization treats a one point drop in Polity score the same as an eight point drop, even though the latter might represent a more significant autocratization. To address this, I perform robustness checks by running multiple models that use alternative measures of the DV. For example, the average change in polity scores in a network and the sum of the magnitude of all changes in a network, both of which would be continuous variables. I also test robustness by trying models where I lead the DV by two years to account for temporal sensitivity of autocratic diffusion, as well as different measures of autocratization such as V-Dem's Polyarchy Index which is an alternative measure of the level of electoral democracy in a country (Coppedge et al. 2025).

To test my first hypothesis which looks at the effect of centrality of autocratic states in a trade network has on autocratic diffusion, I do as follows. I operationalize the centrality of an autocratic state in a trade network as a binary variable. I apply the Eigenvector centrality formula to all states in a network-year. The formula outputs a score representing the degree to which a node/state in a network is well-connected to the overall network, but also well-connected to other such well-connected states (Ruhnau 2000). As a country's influence within a network increases, so too does its eigenvector centrality score. This process has been done in papers such as Lee et

al. (2016) and Antonietti et al. (2022), and works especially well in networks that change through time (Taylor et al. 2017) like trade. Using the constructed matrix of states in a trade network, I apply the eigen_centrality function from the igraph package in R (Csárdi et al. 2025) to find the eigenvector centrality scores of all states in a network. If the state with the highest centrality score has a polity score between -10 and -6, defined as autocratic by the Polity5 dataset, then I code this variable as 1, and 0 if otherwise.

To test my second hypothesis, which is about the proportion of trade connections to autocracies, I operationalize my IV: autocratic trade ties, as a continuous variable bounded between 0 and 1. I calculate the proportion of trade connections to autocracies by dividing the number of nodes/countries in the trade network that have a direct trade tie to an autocracy by the total number of nodes in the network in a given year. Again, the data to measure this will be gathered from COMTRADE and the Polity5 project. I define trade ties as any non-zero volume of trade between two states in a network, following the approach used in Sajedianfard et al. (2021). To confirm robustness, I run models with an alternative measure of this IV using thresholds of trade based on the quantiles of trade flows between states, for example only counting trade above the 25th quartile.

To test my third hypothesis, that democratic trade ties in a network can act as a buffer to autocratic diffusion, I use an IV of Autocratic-Democratic Balance. I operationalize this metric as a continuous variable measuring the ratio of number of nodes connected to democracies (Polity5 scores of 6 to 10) to the number of nodes connected to autocracies. Reflecting the reality that states trade with both autocracies and democracies in the modern international system, nodes can be counted for connections to either polity type; I expect that most nodes will have some autocratic and democratic partners in a network. Hypothetically, a trade network that is balanced will have a ratio greater than or equal to one, while trade networks skewed towards autocracies will have a ratio lower than one. A higher measure implies greater exposure to democratic pressures and norms.

I control for two confounding variables. Given the unique nature of network-year as a unit of analysis, any control has to take into account how aspects of the structure of trade networks not discussed in my theory and hypotheses can affect autocratic diffusion. The first is the size of the trade network. Simply by virtue of having more states present, a large network mechanically has more opportunities for autocratization and thus could bias the model if not accounted for. I also control for the lagged number of autocratization events from the previous year among member states in order to address the possibility that observed instances of the DV are actually representative of ongoing political changes rather than impact of network structure. The latter will also be reexamined for alternative operationalizations of the DV used in robustness checks.

Given that the DV is a count variable, I use a poisson distribution regression model. In the event that the data is overdispersed and the variance of the DV is greater than the mean, I use a negative binomial distribution model for robustness. With the operationalization of my variables, Figure 3 shows an example of a row in the constructed novel dataset:

| Year (T) | Network | Autocratic Centrality (H1) | Autocratic Trade Ties Ratio (H2) | Democracy to Autocracy trade Ratio (H3) | # of countries that autocratized in Year + 1 (DV) | # of Count-ries | # of previous autocrati-zation events |
|---|---|---|---|---|---|---|---|
| 2010 | 2010-A | 1 | 0.76 | 0.31 | 5 | 7 | 2 |

*Figure 3. Sample row in dataset used for quantitative analysis*

**Policy Implications and Conclusion**

The research performed in my capstone contributes to the growing field of study on autocratic diffusion by introducing a network-based analysis and framework for understanding how trade can induce and influence political regime transition. Conventional literature and theories has treated international trade as a force that spreads democracy through economic liberalization, but my capstone challenges this assumption by introducing the idea that trade networks, especially those dominated by autocracies, can spread autocratic norms amongst member states. The usage of network theory in my capstone reflects a trend in the overall literature toward a shift away from a focus dyadic bilateral trade frameworks to interconnected trade relationships, and in doing so addresses how the changing focus affects theories on elite decision making.

The findings of this research would have policy implications for any party interested in fostering democracy or autocracy. If the hypotheses are true, they would primarily suggest that trade can lead to autocratic diffusion and thus policymakers would have to reconsider past ideas that assume trade supports liberalization. One could also identify countries that are more susceptible to autocratization based on the trade network they participate in in a given year and the structure of that network. This could aid democratic institutions and actors in focusing on key targets based on strategic goals such as maintaining global democracy. The third hypothesis especially could show the importance of democratic trade blocs and incentivize a concerted effort to include at-risk states in trade amongst democracies to prevent autocratic diffusion.

In addition to the theoretical and policy contributions of my capstone, I propose a novel dataset for examining autocratic diffusion within trade networks. Aside from autocratic diffusion research, this dataset could provide a comprehensive list of all trade networks in the global trade system which could be used by scholars outside the field of diffusion as well. This dataset could open paths for future research beyond dyadic analysis that tests other features of networks such as the length of time states are in the same network. Despite these contributions, it is important that further research on the diffusion of political models, especially autocracy, is done, especially as global power dynamics continue to shift through time.

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