# HEC Montréal

## Declining business dynamism in the U.S.: A causal overview

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**Management sciences**

**(Applied economics)**

*Thesis submitted for the master of science in management degree (M.Sc.)*

June, 2018

**Abstract**

In the U.S., business dynamism as measured by both firm entry and exit rates has been declining for the last four decades. We therefore study the association between the downturn in U.S. business activity, demographic shifts, trade exposure and market concentration. To do so, we implement three distinct instrumental variable strategy and two main findings emerge. First, we observe that trade exposed Metropolitan Statistical Areas (MSA) experience higher rates of establishment exit by as much as 24 percent for every 1000$ USD of additional imports per establishment. Second, we show that concentrated labor markets are associated with lower establishment entry rates. In fact, a one percentage point increase in the share of large firms in any given MSA seems to cut down its establishment entry rate by almost 2 percentage points in average. Although worrying, theses results are consistent with standard economic theory on trade and market concentration. On the one hand, MSAs exposed to industries in which trade partners have a productivity advantage should indeed lose business to foreign firms. On the other hand, with imperfect competition and information in the labor market, worker preferences might be persistently skewed towards large employers if those firms provide non-pay benefits that are not compensated for by wages or if their size is the best available proxy for job security. In both cases, large firms might make the recruitment process more arduous for smaller ones, thus deterring firm entry. Overall, with more informed trade and antitrust policies we might be able to mitigate the costs of trade and bring back the lost dynamism of U.S. businesses.

# Acknowledgements

I would first and foremost like to express my great appreciation and thanks to Nicolas Vincent, who directed this research through clever insights and his notoriously contagious passion for economics. I am immensely grateful for his unwavering support and guidance throughout every stage of this research and of my time at HEC Montréal.

I also thank my parents who encouraged me to pursue graduate studies in economics and helped me nourish my passion for this discipline through their great sense of listening.

Finally, I would like to thank the Chaire de recherche Industrielle Alliance sur les enjeux économiques des changements démographiques for their financial support.

# Contents

# 1 Introduction

Since the 1980s, firm dynamism in the U.S. has followed a worrisome trajectory. In fact, almost all indicators of firm activity have been declining over the past four decades. Among those, persistent declines in firm entry and exit rates have captured wide interest in recent years. This substantial shift in productive activity from younger firms to older ones is unprecedented both in terms of magnitude and scope. Indeed, this trend has been observed across almost all U.S. metropolitan areas and states. Further, it is also broad-based across sectors, which indicates that this pattern is orthogonal to any possible compositional shift in production. This is particularly worrying since entry and exit rates have been found to be critical determinants of employment along with both firm-level and aggregate productivity.

While the literature has widely covered the consequences of declining firm dynamism in the U.S., very few studies have documented its causes. The aim of this paper is thus to identify some of the main factors behind this disquieting trend. More precisely, we intend to explicitly examine the causal relationship between business dynamism and potential explanations such as demographic shifts, trade exposure and market concentration. Matching the U.S. Census Bureau's Business Dynamics Statistics, its Populations Estimates Program and County Business Patterns data with the UN Comrade Database, we find sizable and somewhat consistent causal associations between trade exposure, market concentration and establishment dynamics.

Our work contributes to the increasingly relevant discussion on U.S. business dynamism by investigating the causal side of this issue. In light of our results, more informed policies on international trade and market concentration could have avoided many market exits by U.S. firms and they could possibly bring back business dynamism to its historical level, thereby increasing productivity and employment. In fact, recent work on the consequences of declining business dynamism showed that, through resource allocation channels, firm-level productivity heterogeneity and a disproportionate contribution to job creation by entering firms, the slow-down in firm entries and exits can substantially affect these highly important macroeconomic variables. Therefore, understanding the very causes of the downturn in business dynamism is critical for economic policies to be able to prevent further degradation of both productivity and employment.

As mentioned above, to come up with these results, we used four different data sources that we matched on the MSA and year level. The first and central database in our analysis is the U.S. Census Bureau's Business Dynamics Statistics. The public version of this program provides information on both firm and establishment characteristics, dynamism measures and employment statistics at the MSA level. In this data source, not only do we observe large broad-based declines in multiple business dynamism measures, but also an increasing and correspondingly broad trend in market concentration as measured by the MSA level share of large firms (2500 or more employees). This measure obviously only reflects labor market concentration, but we believe that an increasingly oligopsonistic labor market can make the recruiting process much harder for start-ups, thus deterring firm entry. For the demographic side of our analysis, we use the publicly available Populations Estimates Program from the U.S. Census Bureau. In this database, we first show that the the share of the 35-44 years old age group in the U.S. working age population (the share of prime-aged entrepreneurs according to the literature) has been declining for about two decades. Further, as previously documented, we observe that the U.S. working age population growth rate fell from about 1.5 percentage points since the 1980s. This means that, not only has the share of prime-aged individuals in the pool of potential entrepreneurs declined, but the pool also started growing at a much slower pace. Knowing this, it is important to mention that the association between those demographic shifts and the declining U.S. business dynamism can best be described through an entrepreneur channel where a drop in the quantity entrepreneurs should have a negative impact on one side of the business dynamism decline, that is firm entries. Lastly, we used both the U.S. Census Bureau's County Business Patterns data and the UN Comrade Database to measure U.S. trade exposure at the MSA level. Perhaps not surprisingly, we observe that the establishment-based trade exposure measure we construct increases for most MSAs even though it does so heterogeneously across the country. In this case, we believe than an increased level of foreign competition not only shifts sales from existing domestic firms to foreign ones, but it can also deter entry in industries in which foreign countries are highly productive. Overall, all these trends share two particular characteristics: broadness across MSAs and a sensible theoretical association with business dynamism that we will cover in more details in later sections of this paper.

In order to establish a causal relationship between demographic shifts, trade exposure, market concentration and the decline in business dynamism, we need to tackle the rather obvious endogeneity problems. In fact, on the market concentration side, the reverse causality problem is quite straightforward. Any changes in the number of operating firms due to either entries or exits will affect the distribution of firm size across incumbents. For instance, since most entering firms employ very few employees, an increase in firm entry will lower the average firm size. Therefore, it is plausible that business dynamism measures such as firm entries and exits will affect the share of large firms in a region (our measure of market concentration) by increasing the denominator without affecting the numerator. With respect to demographics, the reverse causality might materialize through inter-MSA migration. Indeed, increases in firm entries in some MSAs might attract individuals seeking job opportunities, thus changing the age distribution of those same MSAs. Lastly, on the trade exposure side, it wouldn't be surprising that shifts in firm entries and exits would affect the demand for several imported intermediate goods and services. If that is the case, the causality might run from business dynamism to trade exposure instead of the other way around. Overall, since all of our potential explanations of the decline in business dynamism are plausibly endogenous, we employ an instrumental variable strategy for each of them. More precisely, we first construct a Bartik instrument for our market concentration measure that exploits the exogenous variation in the proportion of U.S. employment that is captured by different firm size groups. Second, we instrument the share of 35-44 years old in the working age population (15-64 years old) by the share of 25-34 years old in the 5-54 years old age group from the preceding decade. At last, for our trade exposure measure, we once more use a Bartik instrument developed by Autor, Dorn and Hanson (2013) that exploits the exogenous variation across MSAs of the inner industry structure of imports changes.

Using this strategy, we find that both the trade exposure and market concentration explanations seem to be convincingly at play. Indeed, we show that a $1000 USD rise in import exposure per establishment increases establishment exits by 24 percent and that a one percentage point rise in the share of large firms reduces the establishment entry rate by 1.98 percentage points. These estimates are surprisingly large but the average MSA-level share of large firms was around 5 percent in 1980 and 7 percent in 2014. This means that a one percentage point increase represents half of the total rise in market concentration between 1980 and 2014. Overall, the association between these variables is clear and potentially worrying.

The rest of the paper will be structured as follows: Section 2 reviews the relevant literature around the issue of declining U.S. business dynamism. Section 3 discusses and describes our data sources. Section 4 covers our estimation methodology. Section 5 presents the empirical results and assesses their economic significance. Section 6 concludes.

# 2 Literature review

## 2.1 The consequences of declining firm dynamism

Most of the research initiatives in the firm dynamism literature have coalesced around the consequences of declining firm entry and exit rates. One of these consequences is a substantial slowdown in both firm-level and aggregate productivity. Although firm-level productive technology is known to be a main driver of productivity, the allocation process of resources to their most productive uses and the negative selection of unproductive firms are not to be downplayed. In fact, it is mostly through these latter channels that lower firm entry and exit rates have adversely altered productivity. On the other hand, declines in firm dynamism have also been found to significantly affect employment dynamics. Indeed, since entering firms tend to contribute disproportionately to job growth, the shift in the share of employment from entering firms to older ones has been holding back employment growth and altering its responsiveness to cyclical shocks.

### 2.1.1 Productivity

The channels through which firm entry and exit dynamics impact productivity are numerous and complex. One such channel takes place through the gradual replacement of unproductive firms by more productive ones or Schumpeter's renowned process of creative destruction. This usually occurs either through reallocation or selection mechanisms. On the reallocation side, it is the shift in market shares from unproductive to productive firms that drives productivity. The role of entry and exit rates is subtle in this sub-channel since, in principle, market shares could be reallocated in a static way across existing firms. However, recent work by Alon, Berger, Dent and Pugsley (2017) show that allocative efficiency is lower among older firms. This implies that market share flows towards productive firms are more rigid when entry rates are low. On the selection side, a limit case of the former, the exit of unproductive firms is the main force behind the rise in productivity. This mainly occurs within younger firms where unproductive entrants lose market shares and rapidly exit. Altogether, it has been found that lower business dynamism, through these two sub-channels, reduced U.S. aggregate productivity by 0.10 percentage points a year from 1980 to 2014 (Alon et al., 2017).

Another channel through which productivity is altered by entry and exit rates has to do with the productivity heterogeneity across existing firms. In this case, it is the productive efficiency advantage of younger firms that prompts productivity. In fact, work by Foster, Haltiwanger and Syverson (2008) reveals that entering firms display higher quantity-based productivity than older incumbents. Further, they find barely any evidence of a revenue-based productivity advantage for younger firms since they usually charge lower prices. This finding is consistent with the fact that more productive firms usually find it in their interest to pass on their inferior production costs to consumers through lower prices. One plausible explanation for this quantity-based productivity advantage has been proposed by Acemoglu, Akcigit, Bloom and Kerr (2013) who find that innovation intensity as measured by the ratio of research and development expenditures to sales is substantially higher for younger firms. This productivity advantage from entering firms thus implies that lower entry rates can substantially impede productivity growth.

### 2.1.2 Employment

On the employment side, work by Decker, Haltiwanger, Jarmin and Miranda (2014) show that the number of jobs added by entering firms and establishments amounts to around six percent of the U.S. labor force. Further, since entrants lack previous workers to dismiss, this amount is purely accounted for net job creation. They also find that the contribution of entering firms to employment displays an "up or out" dynamic. On the one hand, most entrants end up exiting within ten years of activity or remain limited in size conditional on survival. Surely, these firms have at most a negligible impact on employment. On the other hand, some entering firms grow at very high rates and contribute disproportionately to job creation. In fact, this narrow fraction of firms adds more jobs than what is subtracted by exits, which indicates that entering firms have a durable and substantial positive impact on net job creation.

For their part, Pugsley and Sahin (2015) show that, other than the decline in firm entry rates mentioned above, employment share has been shifting from young firms to older ones since 1980.

While these occurrences are correlated, there is no obvious causal association relating them. However, through a decomposition procedure, they show that the shift in employment from young to old firms is mainly attributable to the cumulative decline in firm entry rates. Thus, the employment dynamic among existing firms has remained relatively stationary over time. The authors then turn to cyclical considerations and find that these two occurrences driving firm dynamics display opposing forces. On one hand, they show that declining entry rates intensify the response of employment to adverse output shocks while diminishing its sensitivity to positive ones. On the other, they find that the shift in employment from young to old firms decreases the responsiveness of employment to cyclical shocks. However, the magnitude of the employment response to those shocks is larger for the former. Conjointly, these occurrences imply that employment is now more sensitive to output during downturns and less so during upturns. This finding definitely resonates with the Great Recession's sharp decline in economic activity that was subsequently followed by an historically slow recovery.

## 2.2 The causes of declining firm dynamism

While the consequences of declining firm dynamism in the U.S. have been widely documented in the literature, its causes remain somewhat ambiguous. However, three explanations seem to stand out, namely demographic shifts, trade exposure and market concentration. First, demographic shifts bring about disruptions that impact the individual motives of starting a firm while altering aggregate market conditions. Second, trade exposure increases the level of competition that entering and incumbent domestic firms have to face, thus driving some domestic firms out of business and deterring entry. Third, market concentration gives rise to barriers to entry that increase the cost of competing on the output, labor and capital markets for entering firms. All of these factors seem consistent with the observed reduction in firm entry but some contradictions arise with regards to firm exit. Indeed, an aging population and diminishing labor force should depress the entry rate through further retirement decisions and higher real wages respectively. Similarly, increases in trade exposure have previously been found to force incumbent firms out of the market. However, firm exits have been in fact decreasing since the 1980s. Thus, heightened market concentration is the only consistent explanation with regards to this observed decline in firm exits. Indeed, as large firms tend to absorb ever larger market shares, the probability of failure decreases for these firms therefore reducing both firm entry and exit.

### 2.2.1 Demographics

As the largest cohort from the post-war period enters the final phase of its life cycle, the U.S. is undergoing an unprecedented demographic shift. This transition can disrupt firm formation through two channels. On one hand, as the representative U.S. worker ages, individual-level factors that influence one's decision of starting a firm are changing and altering firm entry rates. In fact, inherent factors such as human capital, alertness, time discounting and risk aversion tend to fluctuate over the life cycle. While human capital is an increasing function of age, alertness is likely to decrease as one grows older. Further, the accumulation of assets over the life span reduces risk aversion even though a decreasing time endowment raises the discount rate associated to expected future earnings coming from a firm. The combined effect of these factors suggests an inverted parabolic relationship between an individual's age and decision to start a firm. The age distribution of a given region should therefore impact it's rate of firm entry. On the other hand, the theoretical link between demographic shifts and firm exits is much less clear. Indeed, Ouimet and Zarutskie (2014) show that, for the U.S., a larger share of young workers in a given state is associated with higher entry rates. They also find that young firms disproportionately hire young workers, who receive higher compensation relative to workers of the same age in older firms. They point out that this compensation differential comes from particular abilities of young workers that are critical to firm growth. Similarly, Liang, Wang, and Lazear (2014) show that countries with a younger labor force are much more likely to experience higher rates of firm formation.

On the other hand, the aggregate repercussions of an aging labor force are also changing market conditions that can affect the expected earnings coming from a firm. Indeed, Karahan, Pugsley and Sahin (2016) find that the downturn in the labor force growth rate explains a substantial share of the decline in firm entry rates. They explain that increases in wages resulting from the declining growth rate in the labor force reduce firm profitability and thus dissuade entry.

### 2.2.2 Trade exposure

In other respects, as U.S. employment and manufacturing production fell in the 1990s while wage disparities concurrently increased, trade exposure was initially considered as the primary culprit. In fact, while trade theory informs us that the overall impact of trade on welfare is positive, it also allows for distributional repercussions. More precisely, trade is assumed to pay off in sectors in which the most important factors of production are abundant while it is supposed to be costly for the ones in which they are scarce. As a result of structurally lower levels of U.S. employment in the last decades, labor became relatively scarce. It is thus not surprising that labor-intensive sectors suffered markedly from trade. Looking at local labor markets in which those trade exposed sectors were concentrated, Autor, Dorn and Hanson (2016) find that distributional impacts of trade on employment are substantial and that the subsequent adjustments are strikingly slow. These distributional repercussions include persistently reduced levels of labor participation and income along with higher unemployment.

While most studies on trade exposure were focused on labor market outcomes, noticeably very few of them turned their attention to firm-level ones. However, using U.S. plant-level data ranging from 1977 to 1997, Bernard, Jensen and Schott (2006), show that within industries with higher exposure to trade with labor-intensive countries, the probability of plant exit is substantially higher and employment growth is lower. The plant-level probability of changing industries is also found to be a positive function of trade exposure and labor intensity. Similarly, they find that capital-intensive plants are more likely to survive and hire or produce at higher rates than their labor-intensive counterparts within the same industry. However, their findings seem to display very little evidence about the repercussions of trade on firm entry. One reason for that might be that there are multiple channels with opposing forces at play in this relationship. In fact, it could be that trade exposure exerts a deterrent effect on firm entry. The cost advantage of trade partners might discourage domestic entrepreneurs to start firms in some industries, resulting in a decline in firm entry. However, if imports play the role of inputs for some domestic industries, then this same cost advantage might, on the contrary, encourage domestic entrepreneurs to start firms in those specific industries. Thus, the combination of these two channels might lead to a muted aggregate effect of trade exposure on firm entry.

### 2.2.3 Market concentration

Additionally, barriers to entry constitute the principal and most intuitive channel through which market concentration can impact firm dynamism. However the fact that such barriers are not always easily observable poses a problem for evidence-based research. It is thus appropriate to first define the notion of barriers to entry in order to subsequently identify the observable barriers that are put forth by firms to limit entering competition. In this definition we use a framework where firms compete in four markets, more precisely, the output, input, labor and capital markets. Work by Demsetz (1982) adroitly divides barriers in two groups, namely the ones that result from information costs and those associated with predatory practices in price and quantity determination. In the former group, incomplete information pushes customers and suppliers to rely on a firm's past experiences to make decisions. Indeed, in the output, input, labor and capital markets respectively, the customer, supplier, worker and lender might prefer firms that have made significant investments in those particular markets since it signals reliability. Thus, in the absence of information costs, no such barriers to entry should persist in any of those markets. In the latter group, barriers to entry occur when incumbent firms make suboptimal decisions with regards to price and quantity determination in order to harm entering firms. However, it is quite complicated to distinguish such practices from normal competitive reactions. In fact, entering firms can induce lower prices and higher quantities when competition increases in a given market. Therefore, in order to properly identify predatory practices, one would need to prove that they are suboptimal. This is not trivial since contemporary suboptimal prices and quantities can in fact be optimal if they lead to higher future earnings that compensate for the previous losses, even in the absence of predatory intents. For such reasons, it is arduous to observe this type of barriers to entry.

Work by Autor, Dorn, Katz, Patterson and Van Reenen (2017) show that market concentration has been increasing since the 1980s in all of the major U.S. sectors, both in terms of sales and employment. Whether or not this has lead to an increase in barriers to entry is, as previously mentioned, complicated to observe but one can reasonably infer that it did. Building on this, Hathaway and Litan (2014) find a frail negative relationship between market concentration, which they define as the ratio of the average firm size to the average establishment size within a metropolitan area, and the firm entry rate. However they do not address the plausibility of an inverse causality problem where the firm entry rate might affect the average firm size.

# 3 Data

## 3.1 Business Dynamism

The central data for the analysis comes from the U.S. Census Bureau's Business Dynamics Statistics (BDS). This publicly available program provides firm characteristics and dynamism measures along with employment statistics at the state and MSA level from 1977 to 2014. In the BDS data, MSAs are defined using the 2009 version of the Office of Management and Budget's (OMB) geographical delineations. More specifically, we focus our interest on entries and exits by firm size groups, where firm size is measured in terms of employment. The only limitation in the publicly available version of the BDS data is that we do not observe entries and exits on the firm level but rather on the establishment level. These establishment entries and exits are thus not measures of firm dynamism or formation but rather of business dynamism. However, we also compute the establishment level variables for small firms exclusively (1-4 employees), which approximates more closely firm activity for new players. Further, to measure market concentration in a given MSA, we choose to use the share of firms with over 2500 employees. Substantial increases in this measure over time could be interpreted as an oligopsonistic trend in the labor market.

The two first business dynamism measures that we compute are the establishment entry and exit rates. In Figure 1, we observe that these two measures have been declining since the 1980s for the U.S. overall. However, the establishment entry rate has been falling at a faster pace than its counterpart even as we compute it for small firms exclusively. Further, Figures 2-4 inform us that this trend has been observed across all MSAs, SIC broad industry categories and firm sizes, as documented in previous research. For almost all observations of each of these categories, the average establishment entry and exit rates have been considerably higher in the sub-period 1980-1984 than 2010-2014. To address any concerns about possible post-crisis hysteresis effects, it is worth mentioning that this result holds if we choose to use the sub-period 2003-2007 instead of 2010-2014. Yet, looking at the HP filtered levels of establishment entries and exits for the U.S. overall in Figure 5, we notice that these measures have been increasing until the mid 2000s. However, it has done so at a marginally decreasing rate before declining after the Great Recession. For small firms exclusively, the same figure shows that, around 2010, exits have exceeded entries for the first time since those measures were recorded in the U.S.. Overall, this broad-based decline in

U.S. business dynamism suggests that the causes we choose to study must also be observed across the board to show sufficient explanatory power.

One such explanation is increasing market concentration, which, as Figure 6 shows, has been observed across almost every MSA. We decide to measure market concentration as the MSA level share of large firms (2500 or more employees), which is quite straightforward. As mentioned above, with relatively stable employment, an increase in this proportion over time points to an oligopsonistic trend in the labor market. This might alter establishment formation by making the recruitment process more laborious for entering firms. At first glance, this explanation seems to satisfy the first condition of being broad-based across MSAs, thus making it a credible potential cause of the decline in business dynamism.

As a further descriptive tool, in Figure 7, we compute a counterfactual establishment count. This count is calculated using the initial 1977 factual establishment count and the 1980-1984 sub-period average establishment growth rate. In this specification the establishment growth rate is simply the difference between the establishment entry rate and the establishment exit rate. We plot the factual and counterfactual establishment counts for all firms and small firms exclusively and the resulting figure is rather surprising. On one hand, for establishments from all firm sizes, the Great Recession seems like the dominant factor behind the final difference between the factual and counterfactual establishment counts. Indeed, both counts seem to display a similar growth rate until the mid-2000s. On the other hand however, had the U.S. maintained a growth rate similar to that of the 1978-1982 sub-period for establishments from small firms exclusively, the count of these establishments would be higher today by millions. If we consider that those establishments are more precisely tracking firm-level dynamics for entrants, this figure displays a substantial contrast in the fundamental structure of the U.S. economy.

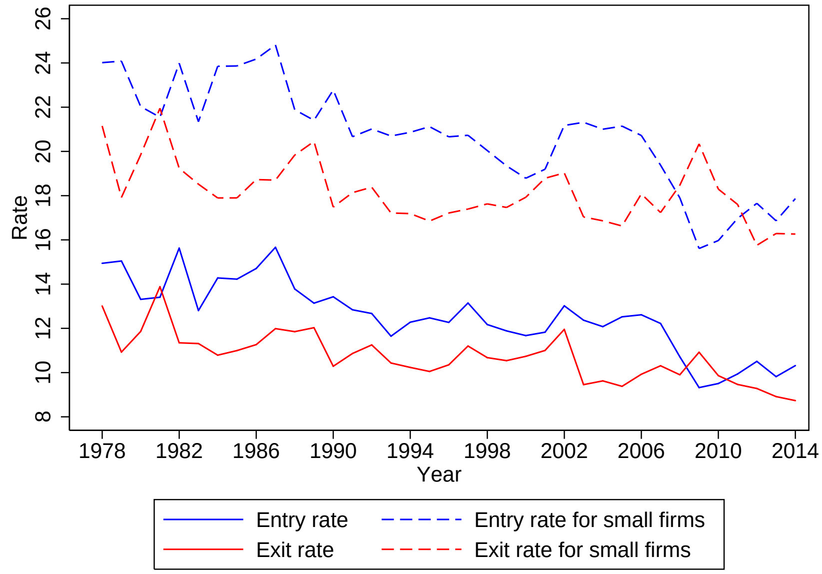


Figure 1: **Establishment entry and exit rates**. The establishment entry and exit rates can be defined as $100 \cdot \left(\frac{B_t}{0.5(B_t + B_{t-1})}\right)$, where $B_t$ is the number of establishment entries or exits at time $t$. The scale of the vertical axis is defined in terms of percentage.

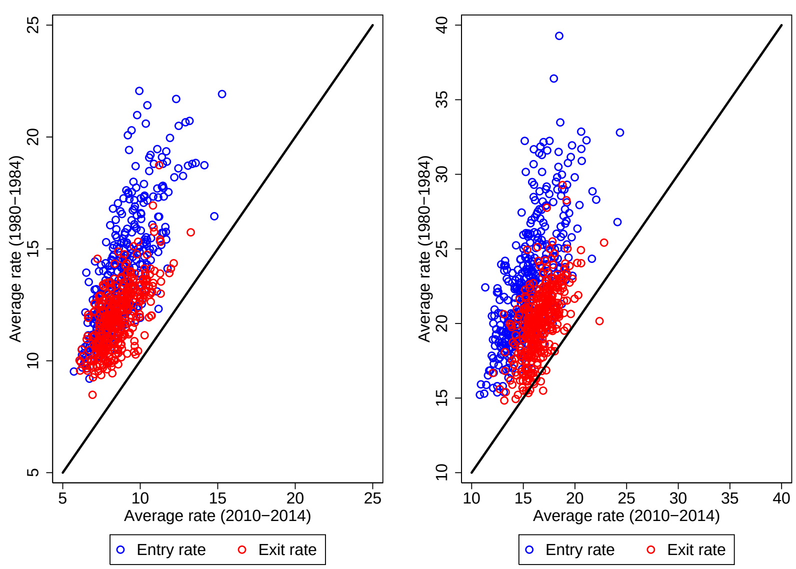


Figure 2: **Establishment entry and exit rates across MSAs**. The two graphs plot the average MSA level establishment entry and exit rates for the sub-periods 1980-1984 and 2010-2014. The entry and exit rates are computed for all firms in the left panel and for small firms exclusively in the right panel. The scale of the vertical and horizontal axes is defined in terms of percentage.

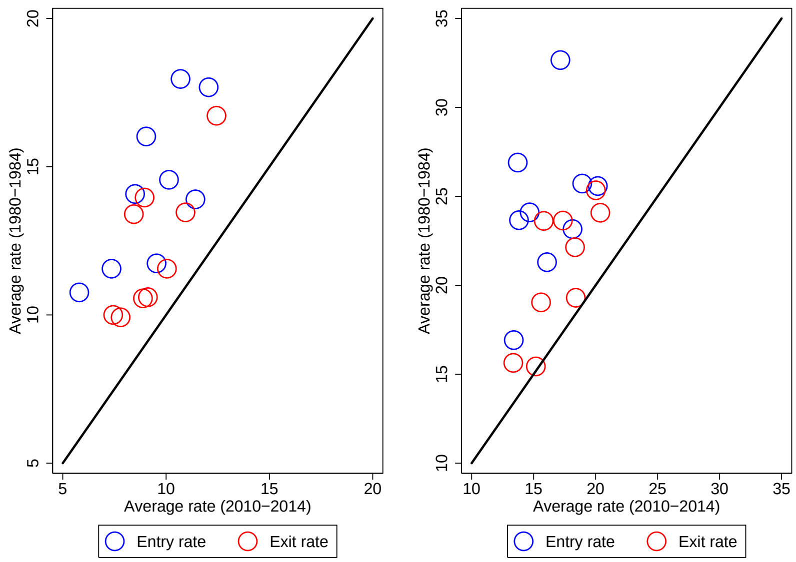


Figure 3: **Establishment entry and exit rates across broad industry categories**. The two graphs plot the average sector level establishment entry and exit rates for the sub-periods 1980-1984 and 2010-2014. The entry and exit rates are computed for all firms in the left panel and for small firms exclusively in the right panel. The scale of the vertical and horizontal axes is defined in terms of percentage.

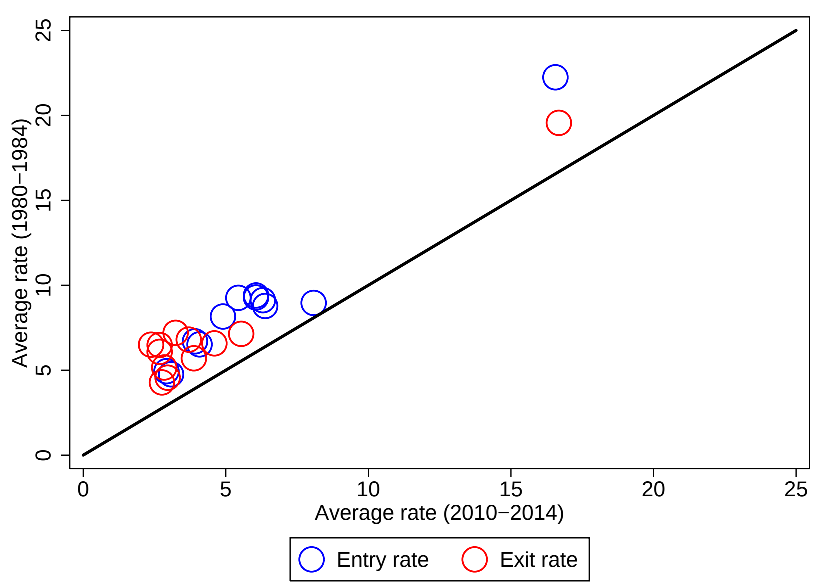


Figure 4: **Establishment entry and exit rates across firm sizes**. The two graphs plot the average sector level establishment entry and exit rates for the sub-periods 1980-1984 and 2010-2014. The scale of the vertical and horizontal axes is defined in terms of percentage.

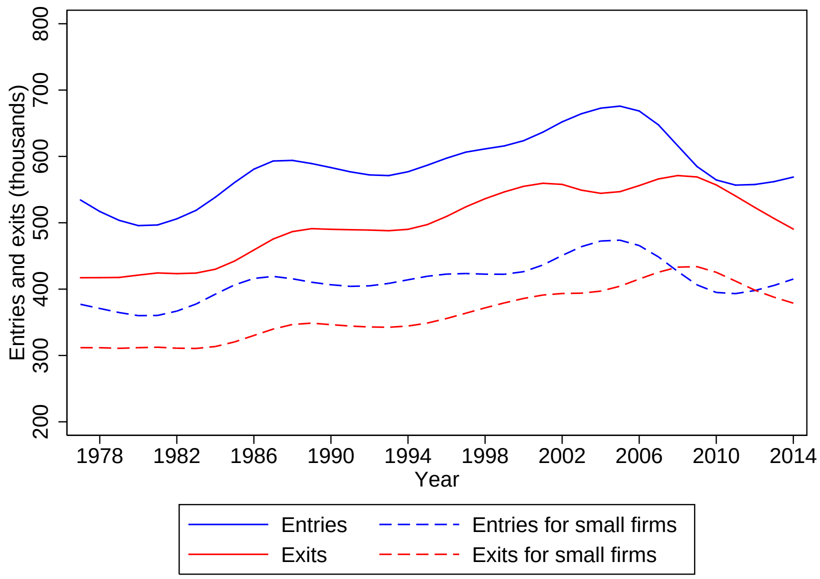


Figure 5: **Establishment entries and exits**. The establishment entries and exits are HP filtered with smoothing parameter 6.25. The scale of the vertical axis is defined in terms of thousands of entries or exits.

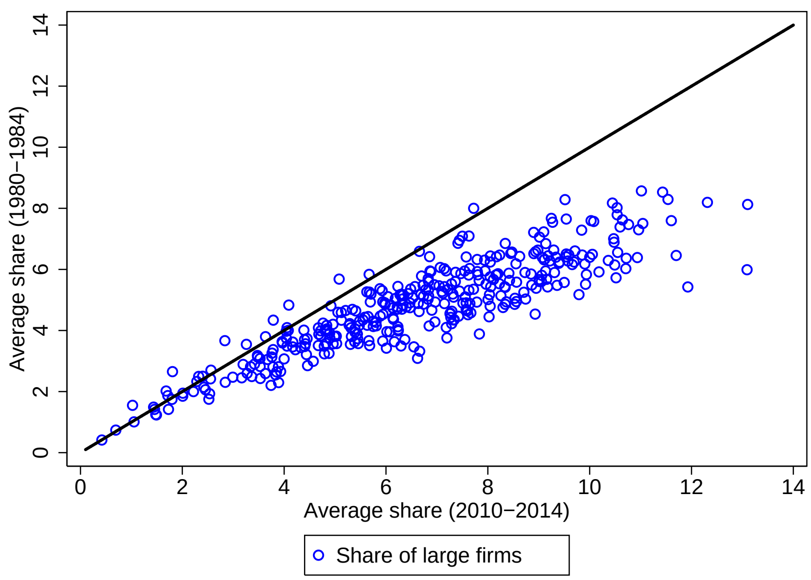


Figure 6: **Market concentration measures**. This plots the average MSA level share of large firms for the sub-periods 1980-1984 and 2010-2014. The scale of the vertical and horizontal axes is defined in terms of percentage.

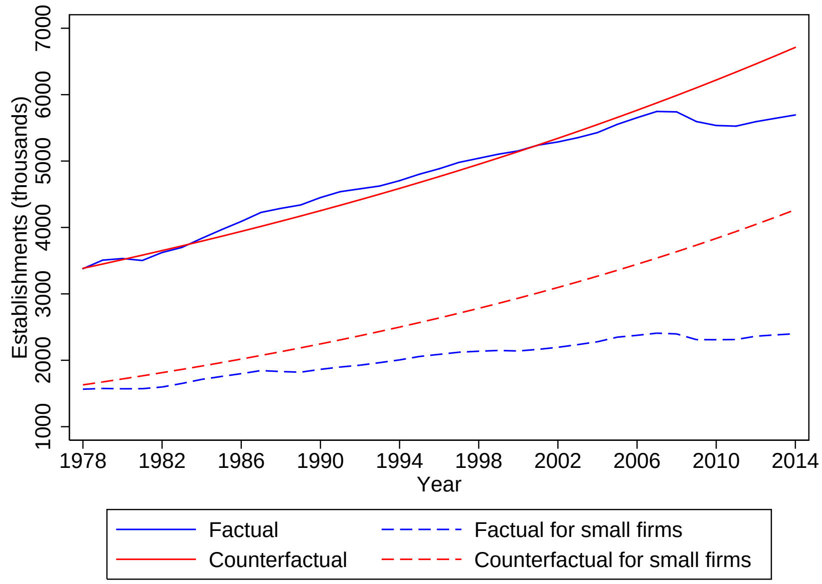


Figure 7: **Counterfactual establishment count**. The counterfactual establishment counts are measured using the 1977 factual establishment count and the 1980-1984 average establishment growth rate (establishment entry rate minus establishment exit rate) for all firms (solid) and small firms exclusively (dashed). The scale of the vertical axis is defined in terms of thousands of establishments.

## 3.2 Demographics

With regards to demographics, the data used for the analysis comes from the U.S. Census Bureau's Populations Estimates Program (PEP). This program is conducted every year at the national, state and county level and uses current data on births, deaths and migration to compute annual population changes by demographic characteristics. More precisely, we focus on the population estimates by age groups for years 1970 to 2016. However, since those estimates are calculated at the county level, we use the 2009 version of the OMB's geographical delineations that link counties to MSAs. From this, we compute the total population and some population shares by several age groups on the MSA level.

In the MSAs considered in the analysis, two population tendencies stand out. In fact, Figure 7 first shows that the share of the 35-44 years old in the U.S. working age population has been increasing until the mid 1990s to subsequently enter a phase of steady decline until the end of our time sample. The 35-44 years old age group has been consistently considered as the most entrepreneurial in the literature, which is why we decided to compare this group relative to the working age population. In the same figure, we observe that the share of the working age population relative to the total population has followed a two hump-shaped trajectory with peaks around the mid 1980s and before the Great Recession. Accordingly, the HP filtered growth rate of the U.S. working population shown in Figure 8 has been mostly declining in our sample except for the 1990s. Other than being a rough approximation of the pool of potential entrepreneurs, the working age population can also affect market conditions faced by entering firms such as wages. Thus, we decide to consider this measure as a potential cause behind the declining business dynamism. However, for both explanations to be judged reasonable, they must at least be observed across most MSAs. Figure 9 shows that both the entrepreneurial share of the working age population and the growth rate of the working age population have been declining for almost all MSAs if we compare the average of both measures in the sub-periods 1990-1994 and 2010-2014. Therefore, both explanations seem convincing enough to be considered as potential causes of the declining U.S. business dynamism.

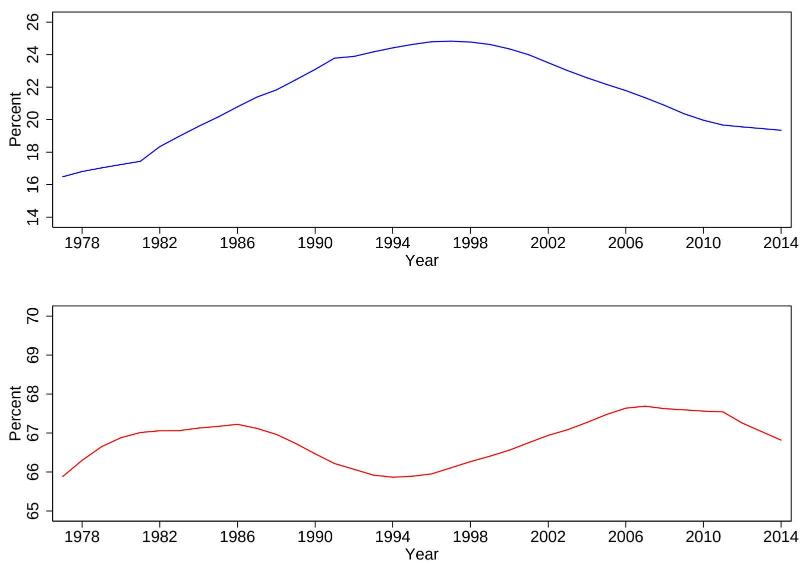


Figure 7: **U.S. population shares overall**. The upper panel shows the share of 35-44 years old in the working age population with respect to the considered MSAs while the lower panel shows the weight of the working age population with regards to the total population in those same MSAs. The scale of both vertical axes is defined in terms of percentage.

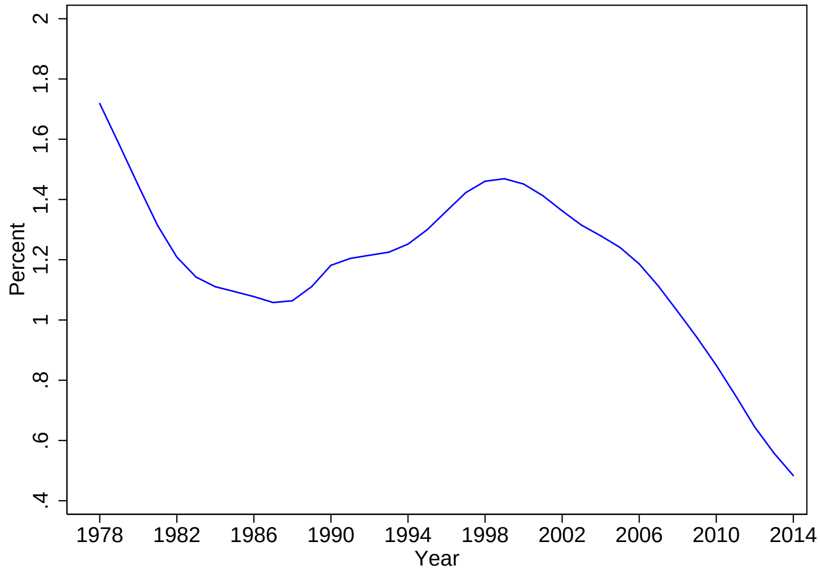


Figure 8: **U.S. working age population growth rate**. The working age population growth rate is HP filtered with smoothing parameter 6.25. The scale of the vertical axis is defined in terms of percentage.

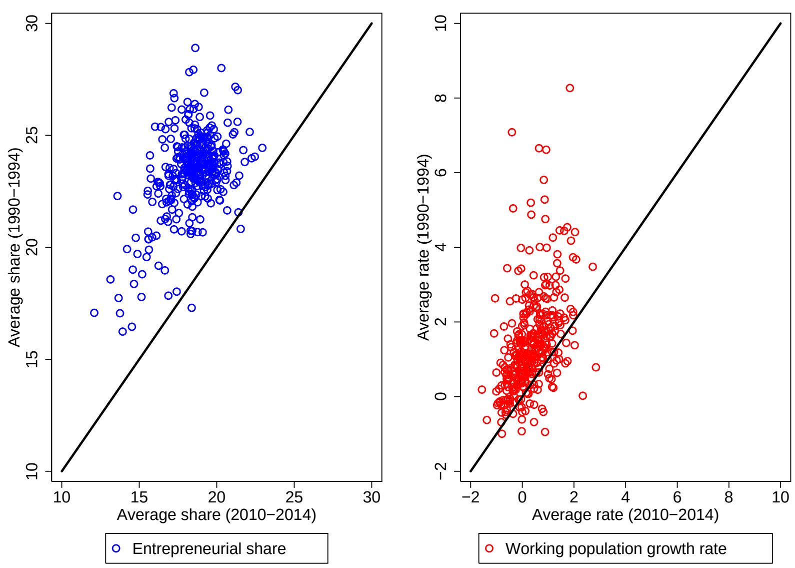


Figure 9: **U.S. population dynamics across MSAs**. The upper panel shows the share of 35-44 years old in the working age population with respect to the considered MSAs while the lower panel shows the weight of the working age population with regards to the total population in those same MSAs. The scale of the vertical and horizontal axes is defined in terms of percentage.

### 3.3 Trade exposure

On the trade exposure side of the analysis, the required information comes from two main sources, namely the UN Comrade Database and the U.S. Census Bureau's County Business Patterns (CBP) data. In the former, following Autor, Dorn and Hanson (2013), we use data on import volumes from China to the U.S. and eight other high-income economies at the six-digit Harmonized System (HS) product level from 1998 to 2014. In the latter, we use establishment data from the same time period and at the same six-digit HS product level to calculate the share of establishments in each product category. The original U.S. data on imports and establishments is respectively delineated at the ZIP code and county level but we aggregate it at the MSA level using the 2009 version of both the U.S. Department of Housing and Urban Development's and the OMB's geographical delineations. The combination of the data from these two sources allows us to compute an establishment-based trade exposure measure at the MSA level for the U.S. and at the group level for the aggregation of eight other high-income economies. Further explanation on the construction of this measure of trade exposure to imports from China will be provided in the following section.

The first thing to notice in Figure 10 is that the U.S. overall level of trade exposure has increased substantially from 1998 to 2014 and it has seemingly done so across many regions. Further, Table 1 shows that there is considerable and persistent variation in trade exposure across U.S. MSAs. In fact, as documented in previous research, for both sub-periods (1998-2000 and 2012-2014), the 75th percentile of average trade exposure is about twice as large as the 25th percentile. Moreover, Figure 11 informs us that, for the same sub-periods, average trade exposure has increased for nearly all MSAs in our sample. Therefore, our measure of trade exposure to imports from China satisfies the geographic broadness condition and can be reasonably considered as a potential cause of declining business dynamism.

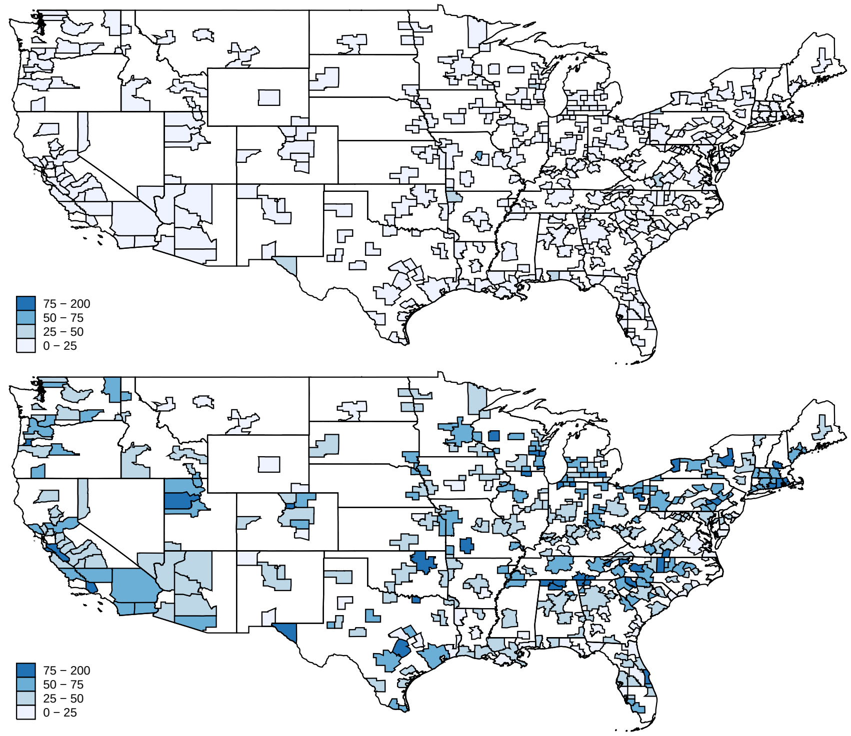


Figure 10: **U.S. trade exposure**. The upper panel shows the measure of trade exposure across the U.S. in 1998 while the lower panel does so for year 2014. The scale of both legends is defined in terms of thousands of USD.

| | 1998-2000 | 2012-2014 |
|---|---|---|
| 25th percentile | 7.27 | 30.23 |
| 50th percentile | 10.12 | 42.23 |
| 75th percentile | 15.42 | 57.29 |

Table 1: **U.S. trade exposure distribution**. The scale of the percentile values is defined in terms of thousands of USD.

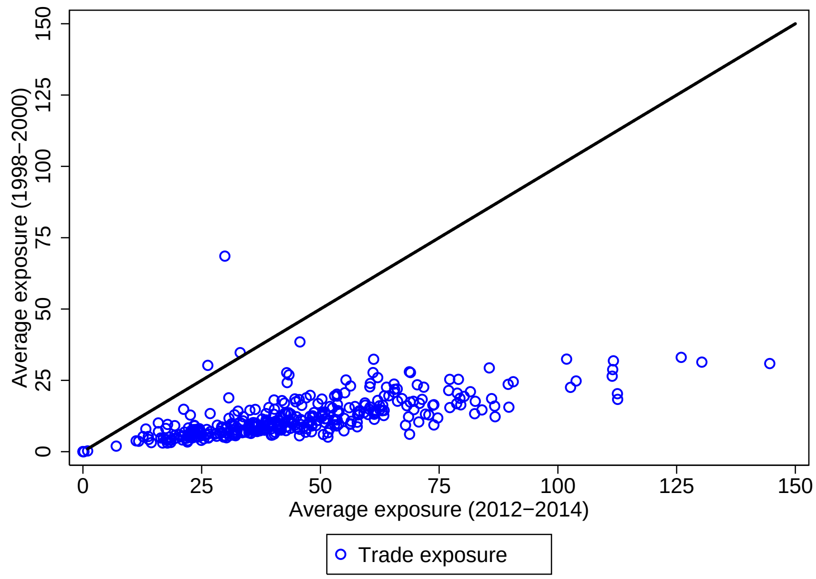


Figure 11: **U.S. trade exposure across MSAs**. The upper panel shows the measure of trade exposure across MSAs in 1998 while the lower panel does so for year 2014. The scale of the vertical and horizontal axes is defined in terms of thousands of USD.

# 4 Methodology

In order to assess the causal relationship between the considered alternatives and several measures of business dynamism, we employ an instrumental variables strategy. For the demographic explanation, we choose to use the complete panel sample as opposed to a first difference of that panel sample for the two remaining explanations.

## 4.1 Demographics

For the demographic explanation, as mentioned above, we use a simple instrumental variable strategy on a panel sample ranging from 1980 to 2014. Ideally, if we didn't have any concerns about reverse causality, we would simply estimate the following model, where $B_{it}$ is the logarithm of a business dynamism measure for MSA $i$ in year $t$, $E_{it}$ is the share of 35-44 years old in its working age population (15-64 years old), $W_{it}$ is the growth rate of its working age population and $\eta_t$, $\gamma_j$ are time and state fixed effects respectively.

$$B_{it} = \beta_1 E_{it} + \beta_2 W_{it} + \eta_t \delta_1 + \gamma_j \delta_2 + \varepsilon_{it}$$

However, one convincing reason to believe that there could be an inverse causal relationship between business dynamism measures and our explanatory variables is the prominence of internal migration in the U.S. ($\mathbf{E}\left[E_{it}\varepsilon_{it}|\eta_t,\gamma_j\right] \neq 0$ or $\mathbf{E}\left[W_{it}\varepsilon_{it}|\eta_t,\gamma_j\right] \neq 0$). Indeed, there is considerable evidence that labor mobility is still relatively high in the U.S.. Taking this into consideration, it is reasonable to believe that workers might decide to move to MSAs where business dynamism is higher to find better employment opportunities. This decision in turn affects the age distribution of the involved MSAs and both of our explanatory variables are directly related to the working age population. It is thus very possible that variations in business dynamism might affect both of our explanatory variables. Further, assuming that agents are forward-looking, they might base their migration decisions on future expected business dynamism. Therefore, this dynamic component of the reverse causality problem also has to be addressed properly. In order to do this, we decide to instrument both explanatory variables with a 10-year lag of the 10 years younger age group. For example, this means that we instrument the share of 35-44 years old in the working age population by the 10-year lag of the 25-34 years old share in the 5-54 years old age group and the same goes for the working age population growth rate endogenous variable. However, this identification strategy is based on two assumptions. First, the exclusion restriction requires the share of 25-34 years old in the 5-54 years old age group and this age group's growth rate to have no long-lasting effects on business dynamism after 10 years other than through the two endogenous variables, conditional on time and state fixed effects. This in turn implies that the planning horizon of any agent in terms of migration decisions is less than 10 years. We argue that both of these assumptions are likely to be satisfied. Therefore, the first and second stage equations of our estimation procedure are the following, where we use two-way clustering at the MSA and state level for the standard errors.

$$\begin{aligned}
E_{it} &= \beta_{11} E^*_{it-10} + \beta_{21} W^*_{it-10} + \eta_t \delta_{11} + \gamma_j \delta_{21} + \upsilon_{it} \\
W_{it} &= \beta_{12} E^*_{it-10} + \beta_{22} W^*_{it-10} + \eta_t \delta_{12} + \gamma_j \delta_{22} + \xi_{it} \\
B_{it} &= \beta_{13} \widehat{E}_{it} + \beta_{23} \widehat{W}_{it} + \eta_t \delta_{13} + \gamma_j \delta_{23} + \varepsilon_{it}
\end{aligned}$$

## 4.2 Trade exposure

With regards to trade exposure, we use a Bartik instrumental variable strategy on a panel sample ranging from 1998 to 2014. First, it is important to notice that the widely documented increase in Chinese productivity may have two counteracting effects on U.S. business dynamism. On the one hand, it might depress domestic business dynamism through increased market competition. However, it might also increase the goods and services demand from China, which can be supplied by U.S. firms. In the latter case, increases in Chinese productivity should raise business dynamism in the U.S.. If trade was completely balanced between the U.S. and China, we would expect domestic economic activity to shift from trade exposed industries to less exposed ones, so that overall business dynamism remains stable. However, unbalanced trade would result in curtailed business dynamism in trade exposed industries with possibly no shift of economic activity towards less exposed ones. That being said, there is considerable evidence that U.S. imports from China extensively exceed U.S. exports to China. We thus argue that the import channel should be the prevailing one.

Given this information, it would seem at first intuitive to estimate the effect of the change in MSA level imports from China on the change in business dynamism as measured by entries and exits for example. The following equation expresses this relationship where $\Delta B_i$ is the change in business dynamism measures between 1998 and 2014 of MSA $i$, $\Delta I_i$ is the change in its imports and $X_i$ is a vector of control variables.

$$\Delta B_i = \beta \Delta I_i + X_i \delta + \Delta \varepsilon_i$$

However, it is reasonable to believe in a reverse causality problem where increases in establishment entries might affect imports from China ($\mathbf{E}\left[\Delta I_i \Delta \varepsilon_i | X_i\right] \neq 0$). In fact, it is plausible that the production technology of some of these new establishments utilizes imported inputs from China. To avoid the reverse causality problem, following Autor, Dorn and Hanson (2013), we use a Bartik instrument. This instrumental variable strategy exploits the inner industry structure of import changes. More precisely, the change in imports from China can be decomposed the following way where $\phi_{ij}$ is the share of imports in MSA $i$ and industry $j$ ($\sum_j \phi_{ij} = 1$) and $dI_{ij}$ is the change in imports.

$$\Delta I_i = \sum_j \phi_{ij} dI_{ij}$$

However, we can further decompose $dI_{ij}$ in three components where $dI_j$ is the industry specific one, $dI_i$ is the MSA specific one and $d\widetilde{I}_{ij}$ is an idiosyncratic industry-MSA specific component.

$$dI_{ij} = dI_j + dI_i + d\widetilde{I}_{ij}$$

Without any loss of generality we can assume that $dI_i$ and $d\widetilde{I}_{ij}$ are both random variables with zero mean to obtain the following Bartik instrument where $\phi_{ij}$ are the start of period industry shares.

$$\Delta Z_i = \sum_j \phi_{ij} dI_j$$

Now assuming that the exclusion restriction is satisfied ($\mathbf{E}\left[\Delta Z_i \Delta \varepsilon_i | X_i\right] = 0$) and that the Bartik instrument is sufficiently correlated with the MSA level imports ($cov\left(\Delta Z_i, \Delta I_i | X_i\right) \neq 0$), we could express the first stage equation in the following way.

$$\Delta I_i = \beta_1 \Delta Z_i + X_i \delta_1 + \upsilon_i$$

However, the exclusion restriction might not be respected if $dI_j$ contains shocks that are specific to different MSAs. For instance, it might be that new establishments in a fairly large MSA are mostly driving the national increase in industry level imports. For this reason, it is preferred to construct the industry level imports using a leave-one-out procedure. For each MSA, the industry level imports will thus be the sum of imports from every other MSA except itself in a specific industry. The only problem with this approach is that imports are unfortunately not observable at the MSA level but only at the industry level. This means that there are three underlying unobserved variables in the first stage equation, namely $\phi_{ij}$, $\Delta I_i$ and $dI_{ij}$. For the former, it is possible to apportion the industry level imports to the considered MSAs using an establishment-based rule. Indeed it is possible to use the MSA level share of establishments in each industry relative to the overall number of establishments in those industries to approximate the import shares. For the second, since the endogenous variable remains unobserved, a first stage regression is not feasible. We thus have to use the Bartik instrument as an exogenous proxy of the MSA level imports. To the extent that the measurement error is uncorrelated with the outcome variables, the estimates will tend to understate the magnitude of the effect of trade exposure on business dynamism. For the third unobserved variable, a supplementary instrumental variable will be needed since the leave-one-out procedure will not be feasible.

Our endogenous trade exposure measure can thus be expressed in the following equation where $S_i$ is the start of period number of establishments for MSA $i$, $S_{ij}$ is the start of period number of establishments for MSA $i$ in manufacturing industry $j$, $S_j$ is the U.S. start of period number of establishments in manufacturing industry $j$ and $dI_j$ is the change in U.S. imports from China in manufacturing industry $j$. In this specification, all industries come from the manufacturing sector since it is widely accepted that it stands as China's most substantial comparative advantage. Further, we normalize industry level imports by the MSA level total number of establishments.

$$\Delta T_i = \sum_j \left(\frac{S_{ij}}{S_j}\right) \left(\frac{dI_j}{S_i}\right)$$

To clarify ideas, $\Delta T_i$ is the equivalent of $\Delta Z_i$, $\left(\frac{S_{ij}}{S_j}\right)$ is the equivalent of $\phi_{ij}$ and $\left(\frac{dI_j}{S_i}\right)$ is the normalized equivalent of $dI_j$. It is clear from the previous equation that the cross-sectional variation only comes from the MSA level establishment structure. More precisely, MSAs can vary with respect to the fraction of total establishments that are in the manufacturing sector and the relative intensity of each of the manufacturing industries. In fact, $\left(\frac{1}{S_i}\right)\sum_j S_{ij}$ informs us about the share of manufacturing establishments and $\sum_j \left(\frac{S_{ij}}{S_j}\right)$ represents the establishment intensity of each manufacturing industry relative to the U.S. overall. Therefore, MSAs with a higher share of manufacturing establishments and those with greater relative intensity in exposed manufacturing industries will be considered as further exposed to trade. Since the trade exposure measure was originally computed at the ZIP level, we used the 2009 version of both the U.S. Department of Housing and Urban Development's and the OMB's geographical delineations to aggregate it at the MSA level. The aggregation rule was a simple establishment-based weighted average. Overall, using this Bartik instrument for trade exposure as a proxy, we obtain the following equation.

$$\Delta B_i = \beta \Delta T_i + X_i \delta + \Delta \varepsilon_i$$

However, as discussed previously, MSA specific shocks might be driving the national industry level changes in imports and the leave-one-out procedure requires additional information on MSA-industry level imports, which are unobserved. Thus, an instrumental variable strategy is needed to treat this reverse causality problem. Following Autor, Dorn and Hanson (2013), we use a non-U.S. trade exposure measure described by the following equation where $dI_j^{ot}$ is the change in imports from China of eight other high-income countries in industry $j$ and the establishment variables are the 10 year lag equivalent of the ones presented above.

$$\Delta T_i^{ot} = \sum_j \left( \frac{S_{ij}^L}{S_j^L} \right) \left( \frac{dI_j^{ot}}{S_i^L} \right)$$

Therefore, the first and second stage equations of the identification strategy are the following.

$$\Delta T_i = \beta_1 \Delta T_i^{ot} + X_i \delta_1 + \Delta \nu_i$$
$$\Delta B_i = \beta_2 \widehat{\Delta T}_i + X_i \delta_2 + \Delta \varepsilon_i$$

With this strategy, identification will be achieved if the co-variation of the industry level imports for the U.S. and the eight other high-income countries result from increased Chinese productivity and (or) reduced trade costs, which we think is a reasonable assumption.

### 4.3 Market concentration

At last, for the market concentration part of the analysis, we again employ a Bartik instrumental variable strategy on a panel sample ranging from 1980 to 2014. However, in this specification, the reverse causality problem is much more straightforward. Without having such considerations, it would seem at least intuitive to estimate the following equation where $\Delta B_i$ is the change in business dynamism measures between 1980 and 2014 in MSA $i$, $\Delta C_i$ is the change in its share of large firms and $X_i$ is a vector of control variables.

$$\Delta B_i = \beta \Delta C_i + X_i \delta + \Delta \varepsilon_i$$

The reverse causality problem is thus clear since, for instance, an establishment entry that in fact represents a firm entry will most probably be of limited size in terms of employees. Therefore, this new entry will change the firm size distribution and consequently affect the share of large firms in a particular MSA. We thus construct the following instrumental variable where $\phi_{if}$ is the start of period share of employment for firm size $f$ in MSA $i$ and $dW_f$ is the overall U.S. change in employment for firm size $f$.

$$\Delta Z_i = \sum_f \phi_{if} dW_f$$

With the exclusion restriction being respected ($\mathbf{E}\left[\Delta Z_i \Delta \varepsilon_i | X_i\right] = 0$) and the Bartik instrument being fairly correlated with the share of large firms ($cov\left(\Delta Z_i, \Delta C_i | X_i\right) \neq 0$), we can write the first stage equation as following.

$$\Delta C_i = \beta_1 \Delta Z_i + X_i \delta_1 + \upsilon_i$$

However, as in the previous section, it is reasonable to believe that the exclusion restriction might not be satisfied. Indeed, if new establishments in a considerably large MSA are mainly driving the national increase in firm size level employment, we would still be left with a reverse causality problem. For this reason, we construct the firm size level employment change using a leave-one-out procedure. In that way, for each MSA, the firm size level employment is the sum of employment from every other MSA in that firm size category except itself. This phases out the MSA-specific shocks that could be contaminating the Bartik instrument.

Overall, the main idea behind this instrument is that one would expect MSAs for which most of the change in employment is absorbed by large firms to surely have a higher share of those firms but also lower business dynamism through the labor market channel. In fact, it could be that large firms have become increasingly attractive employers over time which then substantially impeded the new entrants' ability to recruit competent workers. The instrumental variable we employ thus exploits the compositional structure of the change in employment with respect to firm size to identify this specific labor market channel. Therefore, the first and second stage equations can be written as the following.

$$\Delta C_i = \beta_1 \Delta Z_i + X_i \delta_1 + \upsilon_i$$
$$\Delta B_i = \beta_2 \widehat{\Delta C}_i + X_i \delta_2 + \Delta \varepsilon_i$$

However, there are reasons to believe that our instrument might not satisfy the exclusion restriction. Indeed, if the firm size shares are relatively constant over time and correlated with innovations to business dynamism, then our estimates would be biased. For instance, it could be that firm size shares are correlated with industry shares in each MSA because in some industries, firm more often display increasing returns to scale. Therefore, in those industries, the share of small firms would be smaller while the share of large firms would be relatively bigger. In turn, industry shares could also be correlated with business dynamism since entry-deterrent fixed costs might be naturally lower in some industries than others, which would lead to more entries. In that particular case, our estimate could suffer from bias and lead to misinterpretations of the causal effect of market concentration on business dynamism. Therefore, one must always be careful when using Bartik instruments because the identifying assumptions might not always be clearly satisfied, ans so we advise the reader to interpret our estimates with caution.

# 5 Results

## 5.1 Demographics

Tables 2 and 3 report the estimated relationship between business dynamism measures and the share of 35-44 years old in the working age population along with the growth rate of the working age population. For interpretation purposes, we take the logarithm of the first three outcome variables, namely the number of establishments, establishment entries and establishment exits. Both endogenous explanatory variables are, as mentioned above, instrumented using the 10-year lag of the corresponding 10 years younger age group and standard errors are clustered at the MSA and state level. Further, all regressions are weighted by the MSA level total population, they each control for state and time fixed effects and for a smoothed value of employment at the MSA level. Interestingly, in Table 3, the results remain very similar if we perform the estimation using establishments from small firms exclusively. According to those estimates, a one percentage point increase in the working age population growth rate is associated with a 2.03 percentage point change in the establishment exit rate. It is worth noting that, for this latter result, the estimate is somewhat larger if we use establishments from small firms only. However, it is clear from the first stage regression Angrist-Pischke F-statistic that the instrumental variable we use does not have sufficient predictive power since this statistic is below the implicit threshold of 10. Therefore, the estimate linking the establishment entry rate and the working age population growth rate may not hold any sense of causality.

Overall, these estimates imply that the share of potential prime-aged entrepreneurs in the working age population is simply not an important determinant of business dynamism. However, the working age population growth rate seem to positively correlate with the establishment entry rate. This association may be theoretically rationalized in two ways. One one hand, if we consider the working age population as the total pool of potential entrepreneurs, then a rise in this group's growth rate should naturally increase the rate of firm entry. On the other hand, all other things held constant, a fast growing working age population reduces the relative scarcity of labor and should therefore push down its cost. In turn, lower wages reduce the costs of operating firms which makes it more interesting to start one. However, since our instrument lacks predictive power, the causality might run the other way around. In fact, it could be that a higher firm entry rate in a given

MSA attracts workers from across the U.S. and mechanically increases the growth rate of the working age population. For this specific reason, the reader should interpret our estimates with caution.

| | Establishments | Entries | Exits | Entry rate | Exit rate |
|---|---|---|---|---|---|
| Share of 35-44 YO | 0.49 | 0.51 | 0.46* | 0.10 | -0.29 |
| | (0.34) | (0.32) | (0.26) | (0.10) | (0.21) |
| WAP (GR) | -1.48 | -1.47 | -1.22 | 2.03*** | 2.74* |
| | (1.25) | (1.13) | (0.94) | (0.66) | (1.50) |
| Observations | 12,170 | 12,138 | 12,148 | 12,221 | 12,192 |
| $APF_1$ | 64.34 | 140.50 | 125.64 | 132.34 | 121.99 |
| $APF_2$ | 2.21 | 2.61 | 2.47 | 3.12 | 3.28 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: **Second stage results for all establishments (1980-2014)**. Standard errors are clustered at the MSA and state level. All regressions control for employment and for state and time fixed effects. The two endogenous variables are instrumented using the 10-year lag of their corresponding 10 years younger age group. Observations are weighted with respect to MSA level population. The first stage Angrist-Pischke F-statistic is reported for the first and second endogenous variables at the bottom of the table. All variables are winsorized at the 99 percent level.

| | Establishments | Entries | Exits | Entry rate | Exit rate |
|---|---|---|---|---|---|
| Share of 35-44 YO | 0.41 | 0.47 | 0.37* | 0.13 | -0.62 |
| | (0.29) | (0.31) | (0.21) | (0.21) | (0.41) |
| WAP (GR) | -1.05 | -1.22 | -0.79 | 3.44** | 4.80* |
| | (1.08) | (1.11) | (0.76) | (1.31) | (2.74) |
| Observations | 12,150 | 12,135 | 12,141 | 12,201 | 12,188 |
| $APF_1$ | 40.72 | 89.48 | 80.60 | 143.39 | 131.55 |
| $APF_2$ | 1.75 | 2.09 | 2.03 | 2.16 | 2.18 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: **Second stage results for establishments from small firms exclusively (1980-2014).** Standard errors are clustered at the MSA and state level. All regressions control for employment and for state and time fixed effects. The two endogenous variables are instrumented using the 10-year lag of their corresponding 10 years younger age group. Observations are weighted with respect to MSA level population. The first stage Angrist-Pischke F-statistic is reported for the first and second endogenous variables at the bottom of the table. All variables are winsorized at the 99 percent level.

## 5.2 Trade exposure

For the trade exposure part of the analysis, tables 4-5 show the causal effect of trade exposure on business dynamism for all establishments and establishments from small firms respectively. The three first outcome variables are expressed in log difference and the two remaining ones are simply expressed in difference, where that difference is taken between year 1998 and 2014. The trade exposure endogenous variable is instrumented with the non-U.S. trade exposure instrument, as mentioned in section 4 and standard errors are clustered at the state level. Additionally, each regression is weighted by the MSA level start of period population and they each control for state level heterogeneity as well as a smoothed value of start of period employment at the MSA level. These regressions can be written as the following equation except for the two last outcome variables where we do not apply the logarithm transformation.

$$\Delta log(B_i) = \beta \left( \frac{\widehat{\Delta T}_i}{1000} \right) + X_i \delta + \Delta \varepsilon_i$$

First of all, the instrumental variable strategy seems to hold since the Bartik instrument displays sufficient predictive power. Even though some coefficients are rather imprecisely estimated, the positive relationship between trade exposure and establishment exits seems consistent across both specifications. In fact, we observe that a \$1000 USD rise in import exposure per establishment increases establishment exits by 24 percent. For establishments from small firms exclusively, the estimate is very similar. One could reasonably question these results due to the time window used for the estimation. In fact, since this time frame coincides with the Great Recession, our simple control for start of period employment may not address the problem related to the cyclical component of our business dynamism measures. However, in Appendix A, we present additional results using the same specification but with the first difference being taken between years 1998 and 2006. The estimates remain strikingly consistent.

On the entry side there seems to be no relationship between trade exposure and business dynamism. There are probably quite many explanations for this intriguing dynamic but one of them could be related to entrepreneurial mobility. In this framework, higher trade exposure in a specific industry would certainly deter establishment entries. However, if, for instance, imports are used as inputs for some domestic industries, the resulting lower production costs could encourage entries in those industries. This increase in entries could thus compensate for the deterrent effect of trade exposure on establishment entry.

On the establishment exit side however, the estimates we obtain clearly resonate with those of Bernard, Jensen and Schott (2006) who found that the probability of plant exit is considerably higher for industries with higher trade exposure to labor-intensive countries. In fact, instead of doing the analysis at the plant-industry level, we do it at the establishment-MSA level and find similar results. This is yet another piece of evidence that costs and gains from trade should be evaluated thoroughly and on many angles, whether it is for labor or firm outcomes.

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Trade exposure | 0.03 | -0.01 | $0.24^{**}$ | -0.00 | $0.02^{***}$ |
| | (0.09) | (0.12) | (0.10) | (0.00) | (0.00) |
| Observations | 337 | 337 | 336 | 337 | 337 |
| F-statistic | 11.80 | 11.56 | 11.82 | 12.01 | 11.71 |

Standard errors in parentheses

$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

Table 4: **Second stage results for all establishments (1998-2014)**. Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the trade instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

| | $\Delta$ Establishments | $\Delta$ Entries | $\Delta$ Exits | $\Delta$ Entry rate | $\Delta$ Exit rate |
|---|---|---|---|---|---|
| $\Delta$ Trade exposure | 0.10 | 0.04 | 0.23** | -0.01 | 0.02* |
| | (0.12) | (0.12) | (0.09) | (0.01) | (0.01) |
| Observations | 337 | 337 | 336 | 337 | 338 |
| F-statistic | 11.88 | 11.70 | 11.96 | 12.04 | 11.75 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: **Second stage results for establishments from small firms exclusively (1998-2014).** Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the trade instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

## 5.3 Market concentration

Finally, on the market concentration side, tables 6-7 present the causal association between the share of large firms and business dynamism measures. Similar to previous regressions, we take the log difference over year 1980 and 2014 for the three first outcome variables and the simple difference for the two remaining ones. The endogenous variable is also expressed in difference and instrumented with the Bartik instrumental variable presented in section 4. The three first regressions can thus be written in the following way.

$$\Delta log(B_i) = 100 \cdot \beta \widehat{\Delta C}_i + X_i\delta + \Delta\varepsilon_i$$

Moreover, all regressions are weighted by the start of period MSA level total population, each of them control for state level heterogeneity as well as a smoothed value of start of period employment and standard errors are clustered at the state level. As for previous regressions, results remain consistent when using the establishments from small firms exclusively. These estimates reveal that a one percentage point rise in the share of large firms reduces the establishment entry rate by 1.98 percentage points. This coefficient increases modestly when we perform the estimation with establishments from small firms. In all regressions of both specification, the Bartik instrumental variable shows high predictive power with F-statistics that are consistently superior to the implicit threshold. Therefore, we argue that the causal effect between market concentration and business dynamism is identified. As for the previous set of regressions, one could reasonably argue that our estimates result from the cyclical component of business dynamism since our time window includes the Great Recession. In fact, in this case, the cyclical considerations do seem to play a role in our results. In Appendix A, we present the estimates of regressions with the same specification and a time difference taken between years 1980 and 2006.

Overall, these estimates show that the share of large firms in a given region seems to be an important determinant of business dynamism. This could be due to imperfect information, where economic agents would prefer larger firms over smaller ones. In fact, firm size might be the only available proxy for firm reliability. Customers, suppliers, workers and lenders might then all have such preferences for the simple reason that substantial market investments signals reliability. However, we must clarify that our measure of market concentration only concerns the labor market. We thus cannot generalize these results to the output, input or capital markets. Other than the greater perceived job security in large firms, there could be other reasons why workers would prefer big players: they might offer higher wages as proposed by Moore (1911), be viewed as better career launching pads or provide other highly valued non-pay employee benefits as suggested by Sorkin (2017). With imperfect competition in the labor market these differences in employment characteristics might not all be compensated for by wage differentials, and preferences that are systematically skewed towards larger firms might persistently exist. Overall, such preferences should make the recruitment process much more arduous for entering firms and thus deter entry.

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Share of large firms | 14.79* | 0.51 | 7.87 | -1.98*** | -0.36 |
| | (7.46) | (11.04) | (6.15) | (0.67) | (0.36) |
| Observations | 350 | 350 | 349 | 350 | 350 |
| F-statistic | 24.67 | 25.02 | 21.38 | 18.66 | 15.75 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: **Second stage results for all establishments (1980-2014)**. Standard errors are

clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the market concentration instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Share of large firms | 8.04 | -7.76 | 3.12 | -2.51** | -0.44 |
| | (7.27) | (13.62) | (5.70) | (1.01) | (0.71) |
| Observations | 350 | 350 | 349 | 350 | 351 |
| F-statistic | 31.86 | 27.11 | 25.85 | 22.52 | 20.05 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: **Second stage results for establishments from small firms exclusively (1980-2014).** Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the market concentration instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

# 6 Conclusion

There is now a considerable body of evidence that the U.S. business sector is just not as dynamic as it once was. In fact, entrepreneurs are launching new firms at a much slower pace than they ever did. Not only has it been shown that this decline in business dynamism negatively affects aggregate productivity through an inefficient reallocation channel, but it also slows down job creation in general and job recoveries following recessions. Thus, the question arises: why are entrepreneurs less entrepreneurial?

In this paper, we study the plausibly causal relationship between the declining U.S. business dynamism and three potential explanations, namely demographic shifts, trade exposure and market concentration. Matching multiple programs of the U.S. census data with the UN Comrade database, we find that increasingly trade exposed and concentrated markets are associated with a much more stagnant business environment. In fact, a $1000 USD rise in import exposure per establishment increases establishment exits by 24 percent and a one percentage point rise in the share of large firms reduces the establishment entry rate by 1.98 percentage points.

These results first suggest that the probability of establishment exit is considerably higher for regions with higher trade exposure to labor-intensive countries. This is consistent with standard trade theory where relatively unproductive domestic firms end up losing market shares to more productive foreign ones. However, as documented by Autor, Dorn and Hanson (2013), this might have substantial adverse consequences on the labor market. Second, our results imply that large firms, with size measured in terms of employees, are somehow deterring entrepreneurs from starting new businesses. For several reasons, it might be reasonable to believe that these large firms are more attractive employers than their start-up counterparts. Indeed, among other things, their size might signal greater job security, they might offer a salary premium, be viewed as better career launching pads or provide highly valued non-pay employee benefits. While we do not observe the link between firm size and such employment characteristics, it doesn't sound completely unreasonable, at least to us. Therefore, if "big players" are truly more attractive employers, a greater share of those firms might make the recruitment process much more arduous for small entering firms.

However, the credibility of our results can obviously be questioned due to the limitations of our data. First and foremost, we only observe establishment entries and exits rather than firm-level ones. While the U.S. establishment dynamics might be good indicators of general business dynamism per se or might correlate with firm dynamics, they do not provide a good picture of entrepreneurial activity. In order to partially avoid this problem, we ran the estimation for establishments from small firms exclusively since these might track firm outcomes more closely, at least on the entry side. Another limitation of our data is the lack of covariates at the MSA level. Unobserved variables such as sector specialization for instance might correlate with some of our explanatory variables and introduce biases in our estimates. However, in the confidential version of the U.S. census data, much more information is available at the firm and county level, which provides a more textured picture of the state of the U.S. business sector.

This gives us hope that further research can be conducted on the role of trade exposure and market concentration for business dynamism. With the more detailed version of the U.S. census data, one could use more precise definitions of market concentration both on the labor and output market level. This would enable a researcher to identify what kind of market concentration really affect business dynamism or in other words, where does concentration hurt.

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# A Appendix

## A.1 Robustness

### A.1.1 Trade exposure

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Trade exposure | 0.02 | 0.00 | 0.23*** | -0.00 | 0.01* |
| | (0.06) | (0.09) | (0.06) | (0.01) | (0.01) |
| Observations | 335 | 335 | 334 | 335 | 335 |
| F-statistic | 27.58 | 28.15 | 16.14 | 28.02 | 15.97 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: **Second stage results for all establishments (1998-2006)**. Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the trade instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Trade exposure | 0.09 | 0.03 | 0.21*** | -0.02 | 0.01 |
| | (0.08) | (0.10) | (0.06) | (0.02) | (0.01) |
| Observations | 335 | 335 | 335 | 335 | 336 |
| F-statistic | 27.89 | 28.49 | 16.21 | 28.50 | 27.82 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: **Second stage results for establishments from small firms exclusively (1998-2006)**. Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the trade instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

### A.1.2 Market concentration

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Share of large firms | 26.45* | 4.17 | 12.14 | -3.07* | -0.25 |
| | (13.31) | (23.76) | (9.05) | (1.79) | (0.65) |
| Observations | 349 | 349 | 348 | 349 | 349 |
| F-statistic | 21.54 | 19.72 | 24.10 | 18.75 | 18.20 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: **Second stage results for all establishments (1980-2006)**. Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the market concentration instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.

| | Δ Establishments | Δ Entries | Δ Exits | Δ Entry rate | Δ Exit rate |
|---|---|---|---|---|---|
| Δ Share of large firms | 8.06 | -4.44 | 5.09 | -3.35 | 0.04 |
| | (8.57) | (26.64) | (8.17) | (2.94) | (0.99) |
| Observations | 349 | 349 | 348 | 349 | 350 |
| F-statistic | 35.23 | 24.96 | 30.90 | 22.64 | 23.02 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: **Second stage results for establishments from small firms exclusively (1980-2006)**. Standard errors are clustered at the state level. All regressions include state dummies and control for start of period employment. The endogenous variable is instrumented using the market concentration instrument. Observations are weighted with respect to MSA level start of period population. The first stage F-statistic is reported at the bottom of the table. All variables are winsorized at the 99 percent level.