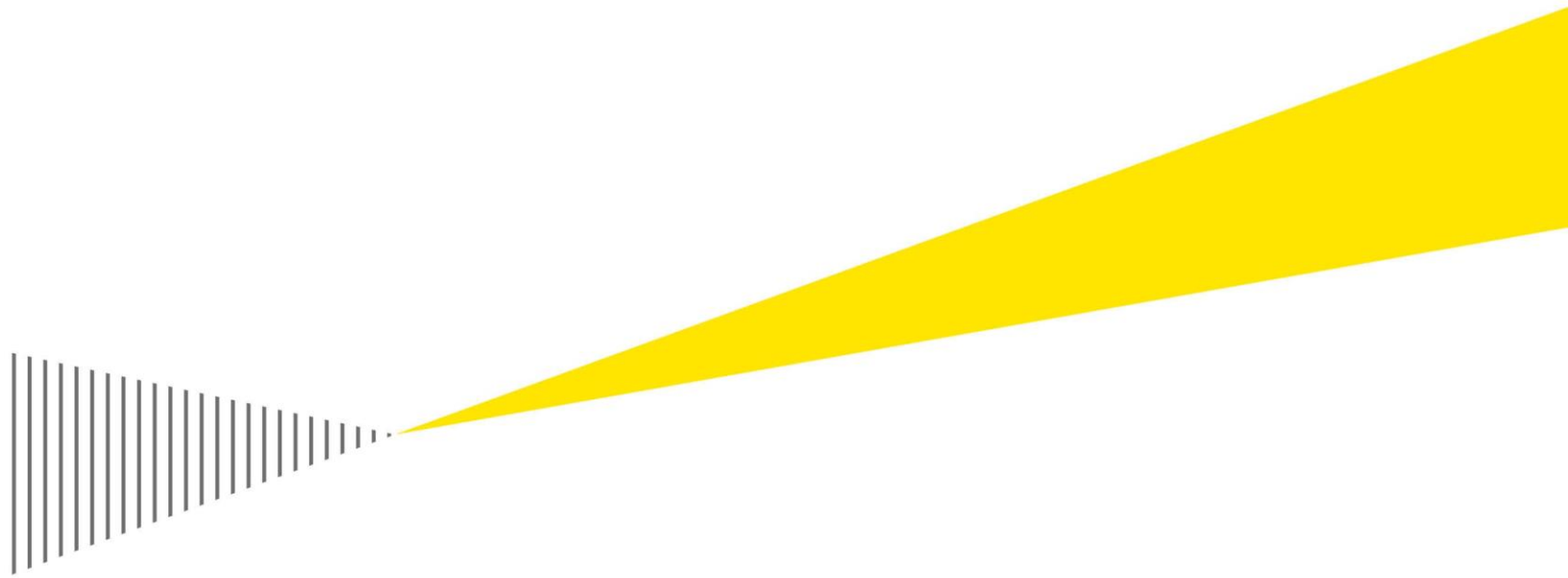
The declining number of public companies and mandatory reporting requirements

Prepared for American Council for Capital Formation

June 2022



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Executive summary

The number of US companies traded on major US exchanges has declined significantly in recent decades. For example, after peaking in 1996 at more than 8,000 companies, the number of domestic US-listed public companies decreased nearly 50% by 2019 (i.e., to approximately 4,300 companies).[1]

Public equity markets can offer multiple benefits for companies and investors. From a company perspective, public share issuance allows access to the $33.9 trillion of US listed equity market capitalization and increases liquidity in the company's stock, allowing company founders and early-stage investors to sell their shares more easily.[2] From an investor perspective, public equity markets facilitate wealth creation by providing more opportunities for returns on capital, and initial public offerings (IPO) in particular allow investments in potentially high-growth companies. Creation of a public secondary market can also offer investors greater liquidity for their existing share holdings. Public equity markets also provide increased corporate accountability because investors can quickly deploy their capital elsewhere in response to company missteps, and regulators require regular and detailed mandatory disclosures from public companies. As a result of this wealth of information and public scrutiny by many potential buyers and sellers, publicly traded share prices generally respond rapidly to emerging events, sending signals to market participants about where to deploy capital and thus increasing overall economic productivity.

The economic research offers multiple explanations for this decline, including declining business dynamism, increases in the availability of private equity, increases in merger and acquisition activity, and higher regulatory compliance costs. One reason for the higher regulatory compliance costs is mandatory reporting requirements for public companies. These reporting requirements help investors better understand public companies by providing periodic updates of financial results, possible company risks, and other materials on company performance. However, complying with these reporting requirements can be costly and could disincentivize companies from being public. That is, increasing the cost of being a public company can reduce the number of public companies.

This report estimates how many fewer US companies were traded on major US exchanges due to mandatory reporting requirements for public companies over the 2000-2019 period. While there are significant shortcomings in the economic research quantifying the impact of mandatory reporting requirements, this analysis relies on a recent framework that reliably captures an economically meaningful share of total mandatory reporting requirements.[3]

[1] "World Development Indicators," World Bank website, databank.worldbank.org, accessed May 2022.
[2] "World Development Indicators," World Bank website, databank.worldbank.org, accessed June 2022. This value is for 2019.
[3] Specifically, this analysis relies on the framework of Ewens et al. (2021). As noted in a recent review of the literature, Leuz and Wysock (2016), the cost of reporting requirements is difficult to quantify and most research to date has been qualitative or survey based. Qualitative research, by definition, is not quantitative and survey-based estimates have an issue of potential overreporting of costs. In contrast, Ewens et al. (2021) relies on a revealed preference framework in the context of Securities and Exchange Commission (SEC) reporting requirements. Specifically, the authors infer reporting requirement costs by examining how much cost companies are willing to incur to avoid increased reporting requirements. This is then used in separate models to estimate the change in the probability of going through an IPO and delisting. There are, however, still significant limitations. Because of the methodology's reliance on changes in

Key results

This report estimates:

- **There were at least 800 fewer US companies traded on major US exchanges at the end of 2019 because of mandatory reporting requirements.**[4] Mandatory reporting requirements – because they have a significant initial fixed cost – primarily contribute via a reduction in IPOs. Note that these companies and the related economic activity do not cease to exist, but rather remain private instead of being public.

- **The median US company that would have been public – but is now, instead, private – is estimated to have 650 workers.** Across the approximately 800 fewer public companies in 2019 this amounts to more than 500,000 workers.

- **The median US company that would have been public – but is now, instead, private – is estimated to have nearly $300 million in revenue.** Across the approximately 800 fewer public companies in 2019 this amounts to upwards of $250 billion in revenue.

- **The median US company that would have been public – but is now, instead, private – is estimated to have over $750 million in market capitalization.** Across the approximately 800 fewer public companies in 2019 this amounts to nearly $600 billion in market capitalization.

- **More costly reporting requirements could be expected to reduce the number of public companies.** This analysis estimates that a 10% increase in reporting requirement cost over the 2000-2019 period would have reduced the number of US companies traded on major exchanges further by 80 companies, with a combined 51,000 employees, $60 billion in revenue, and over $23 billion of market capitalization. These companies and the related economic activity do not cease to exist, but rather remain private instead of being public.

To put these estimates in context, without any mandatory reporting requirements in the 2000-2019 period, the number of public listed companies in 2019 would have been higher by roughly 800, all else equal. That is, there would have been roughly 5,100 publicly listed companies rather

reporting requirements at public float thresholds it cannot examine uniform reporting requirements or industry-specific rules. The estimates are, therefore, conservative. The threshold-based reporting requirements examined in Ewens et al. (2021) include scaled disclosure, non-accelerated filing, Section 404 of Sarbanes-Oxley, and Emerging Growth Company under the JOBS Act. Cost is defined as the net of direct costs (e.g., fees to lawyers and accountants and the cost of internal control system), indirect costs (e.g., competition effects, constraints on operating decisions), and benefits (e.g., reduction in a company's cost of capital). Social benefits of reporting requirements (e.g., competition effects and investor welfare) are not included in this net cost.

[4] All else equal, the number of public companies in the 2019 economy would be higher than the number of public companies in 1996 due to the growing size of the economy. It is therefore not appropriate to compare this estimated reduction to the number of public companies in 1996 or any other available year (i.e., the correct counterfactual for comparison is not observed and this report only analyzes one of the many reasons for the decline in the number of public companies). That said, for purposes of putting the estimated change in publicly listed companies into context, this analysis compares the estimated change in the number of publicly listed companies to the number of listed companies in 2019 before accounting for this change. A similar comparison is also made based on company market capitalization.

than 4,300 in 2019 – a 16% decline – without accounting for the various other factors that may also explain the decline in public listings. Assuming these companies are the size of the median public company in 2019, which tend to be relatively small, this translates into a smaller 1.7% decline when measured by company market capitalization.

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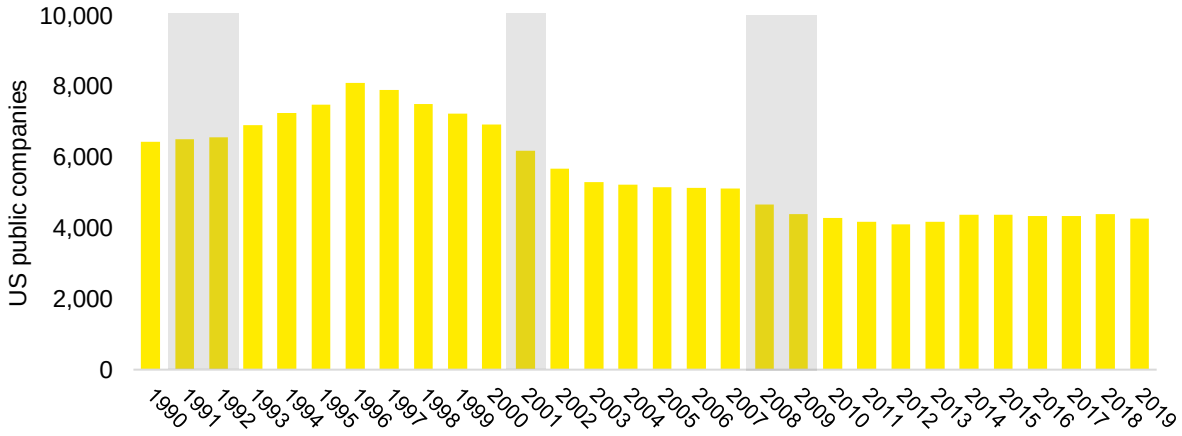
The declining number of public companies and mandatory reporting requirements

I. Introduction

The number of US companies traded on major US exchanges has declined significantly in recent decades.[1] As shown in Figure 1, after peaking in 1996 at more than 8,000 companies, the number of domestic US-listed public companies decreased nearly 50% by 2019 (i.e., to approximately 4,300 companies).[2]

Public equity markets can offer multiple benefits for companies and investors. From a company perspective, public share issuance allows access to the $33.9 trillion of US listed equity market capitalization and increases liquidity in the company's stock, allowing company founders and early-stage investors to sell their shares more easily.[3] From an investor perspective, public equity markets facilitate wealth creation by providing more opportunities for returns on capital, and initial public offerings (IPO) in particular allow investments in potentially high-growth companies. Creation of a public secondary market can also offer investors greater liquidity for their existing share holdings. Public equity markets also provide increased corporate accountability because investors can quickly deploy their capital elsewhere in response to company missteps, and regulators require regular and detailed mandatory disclosures from public companies. As a result of this wealth of information and public scrutiny by many potential buyers and sellers, publicly traded share prices generally respond rapidly to emerging events, sending signals to market participants about where to deploy capital and thus increasing overall economic productivity.

Figure 1. Number of US public companies, 1990-2019



Note: Gray boxes denote recessions.
Source: The World Bank.

The economic research offers multiple explanations for this decline, including declining business dynamism, increases in the availability of private equity, increases in merger and acquisition activity, and higher regulatory compliance costs.[4] One reason for the higher regulatory compliance costs is mandatory reporting requirements for public companies. These reporting requirements help investors better understand public companies by providing periodic updates of financial

results, possible company risks, and other materials on company performance. However, complying with these reporting requirements can be costly and could disincentivize companies from being public. That is, increasing the cost of being a public company can reduce the number of public companies.

This report estimates how many fewer US companies were traded on major US exchanges due to mandatory reporting requirements for public companies over the 2000-2019 period. While there are significant shortcomings in this literature in quantifying the impact of mandatory reporting requirements, this analysis relies on a recent framework that reliably captures an economically meaningful share of total mandatory reporting requirements This report estimates how many fewer US public companies were traded on major US exchanges due to mandatory reporting requirements for public companies over the 2000-2019 period.

Reasons for the declining number of public companies

The economic research offers multiple explanations for this decline, including declining business dynamism, increases in the availability of private equity, increases in merger and acquisition activity, and higher regulatory compliance costs. These reasons are not mutually exclusive and could also interact to exacerbate the decline.

- **Declining business dynamism.** Over the past few decades, the economic literature has noted a decline in business dynamism. Business dynamism is the process of new businesses starting, growing, dying, and being replaced with other more productive businesses. This process creates a churn of new businesses and jobs that can better allocate labor and capital to its most productive uses. With fewer new businesses there would be fewer companies looking to enter the public markets via an IPO.[5]

- **Increases in the availability of private equity.** Over the past few decades, markets experienced a significant shift as private equity, venture capital, and other companies increased the capital available to start-ups. The availability of this private capital allows companies to scale without needing to access public markets for such funding. Accordingly, the literature has found that startup companies tend to stay private longer and can raise increasing amounts of capital in later stage funding rounds. Additionally, the literature has also found that the average company conducting an IPO tends to be older and larger.[6]

- **Increases in merger and acquisition activity.** Another possible explanation for the decrease in publicly listed companies is increasing merger and acquisition activity among companies. If two public companies merge or a larger public company acquires a smaller public company, this will reduce the listed public companies from two to one. Alternatively, a large public company could acquire a private company before it lists on a public exchange. The economic literature has found that an increasing number of newly listed public companies either acquire other public companies or themselves are acquired.[7]

- **Higher regulatory compliance costs.** Another possible explanation involves the increasing regulatory compliance costs required for public companies. One reason for the higher regulatory compliance costs is mandatory reporting requirements for public

companies. Reporting requirements involve financial and risk disclosure mandated by the Securities and Exchange Commission (SEC). Although these have existed since the inception of the Securities and Exchange Act of 1934, they increased significantly since the year 2000. These major regulatory developments include Regulation Fair Disclosure (Reg FD) and the passage of the Sarbanes-Oxley Act of 2002 (SOX) in the wake of multiple corporate scandals in the early 2000s.[8]

II. Mandatory reporting requirements and public companies

This report estimates how many fewer US companies were traded on major US exchanges due to mandatory reporting requirements for public companies over the 2000-2019 period. While there are significant shortcomings in this literature on quantifying the impact of mandatory reporting requirements, this analysis relies on a recent framework that reliably captures an economically meaningful share of total mandatory reporting requirements.

Analysis framework

This report relies on the framework of Ewens et al. (2021). As noted in a recent review of the literature, Leuz and Wysock (2016), the cost of reporting requirements is difficult to quantify and most research to date has been qualitative or survey based.[9] Qualitative research, by definition, is not quantitative and survey-based estimates have an issue of potential overreporting of costs. In contrast, Ewens et al. (2021) relies on a revealed preference framework in the context of the SEC reporting requirements. Specifically, the authors infer reporting requirement costs by examining how much cost companies are willing to incur to avoid increased reporting requirements. This is then used in separate models to estimate the change in the probability of going through an IPO and delisting.

There are, however, still significant limitations. Because of the methodology's reliance on changes in reporting requirements at public float thresholds it cannot examine uniform reporting requirements or industry-specific rules. The estimates are, therefore, conservative. The threshold-based reporting requirements examined in Ewens et al. (2021) include scaled disclosure, non-accelerated filing, Section 404 of Sarbanes-Oxley, and Emerging Growth Company under the JOBS Act. Cost is defined as the net of direct costs (e.g., fees to lawyers and accountants and the cost of internal control system), indirect costs (e.g., competition effects, constraints on operating decisions), and benefits (e.g., reduction in a company's cost of capital). Social benefits of reporting requirements (e.g., competition effects and investor welfare) are not included in this net cost.

Overall, for the median public company, the annual cost of mandatory reporting requirements is estimated to be $45,000 for enhanced disclosure compliance (equivalent to 0.3% of earnings before interest, taxes, depreciation, and amortization (EBITDA)), $126,000 for tightened internal controls (equivalent to 0.9% of EBITDA), and $293,000 for a combination of disclosure and internal governance (2.1% of EBITDA).[10] Additionally, because there is a fixed cost as well as a marginal cost to mandatory reporting requirements smaller public companies can face a higher cost relative to their size when compared to their larger counterparts.[11]

See appendix for further details.

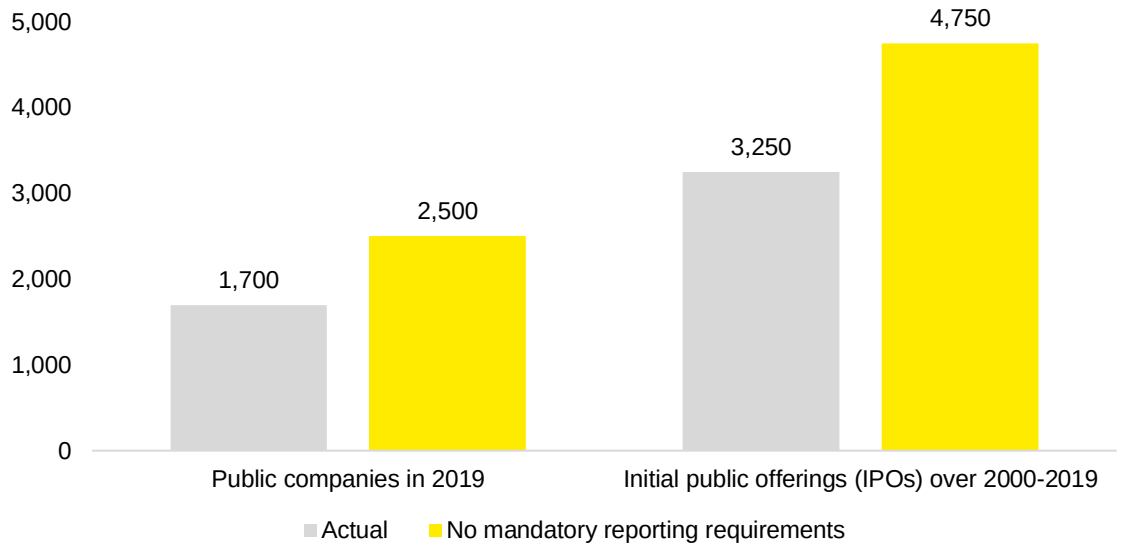
Results

As shown in Figure 2, the analysis estimates that there were at least 800 fewer US public companies listed on major US exchanges at the end of 2019 because of mandatory reporting requirements.[12] These companies and the related economic activity do not cease to exist, but rather remain private instead of being public.

Mandatory reporting requirements – because they have a significant initial fixed cost – primarily contribute via a reduction in IPOs. Specifically, this analysis estimates that there were 1,500 fewer IPOs of US public companies on major US exchanges during the 2000-2019 period because of reporting requirements. There is a larger reduction in the number of IPOs than public companies because many public companies are acquired by other companies, experience bankruptcy, or delist from exchanges for various other reasons.

Figure 2. US public companies and initial public offerings

On major US exchanges



Note: Data exclude special purpose acquisition companies (SPACs) and financial funds. See appendix for details.
Source: Audit Analytics, S&P Capital IQ, and EY analysis.

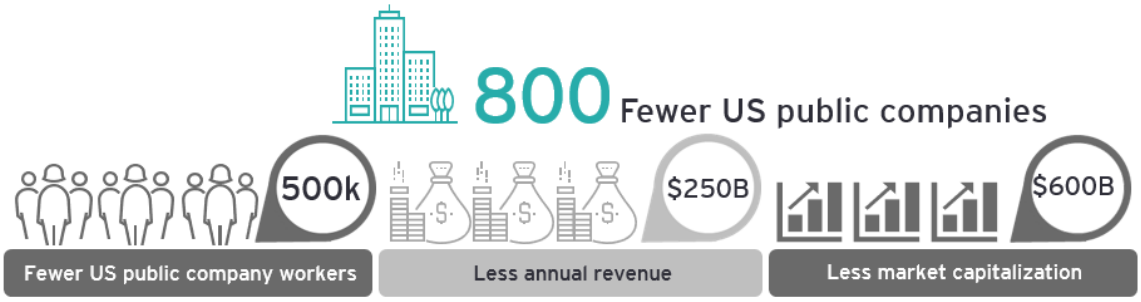
This analysis further estimates the number of workers, revenue, and market capitalization for a US company that would have been public:

- **The median US company that would have been public – but is now, instead, private – is estimated to have 650 workers.** Across the approximately 800 fewer public companies in 2019 this amounts to more than 500,000 workers.
- **The median US company that would have been public – but is now, instead, private – is estimated to have nearly $300 million in revenue.** Across the approximately 800 fewer public companies in 2019 this amounts to upwards of $250 billion in revenue.
- **The median US company that would have been public – but is now, instead, private – is estimated to have over $750 million in market capitalization.** Across the approximately 800 fewer public companies in 2019 this amounts to nearly $600 billion in market capitalization.[13]

To put these estimates in context, without any mandatory reporting requirements in the 2000-2019 period, the number of public listed companies in 2019 would have been higher by roughly 800, all else equal. That is, there would have been roughly 5,100 publicly listed companies rather than 4,300 in 2019 – a 16% decline – without accounting for the various other factors that may

also explain the decline in public listings. Assuming these companies are the size of the median public company in 2019, which tend to be relatively small, this translates into a smaller 1.7% decline when measured by company market capitalization.

Figure 3. Reduction in number of public companies and workers, revenue, and market capitalization at public companies due to mandatory reporting requirements, 2019
On major US exchanges



Note: Figures are rounded. Relying on the framework of Ewens et al. (2021), the analysis estimates the reduction of initial public offerings between 2000-2019 from the costs of mandatory reporting requirements. The analysis examines IPO data because the research indicates it is the primary channel that mandatory reporting requirements affects. The analysis assumes the survival rate for the companies that did not go public due to mandatory reporting requirements is the same as those that did go public. The analysis excludes special purpose acquisition funds (SPACs) and financial funds. These companies and the related economic activity do not cease to exist, but rather remain private instead of being public. See appendix for details.
Source: Audit Analytics, S&P Capital IQ, and EY analysis.

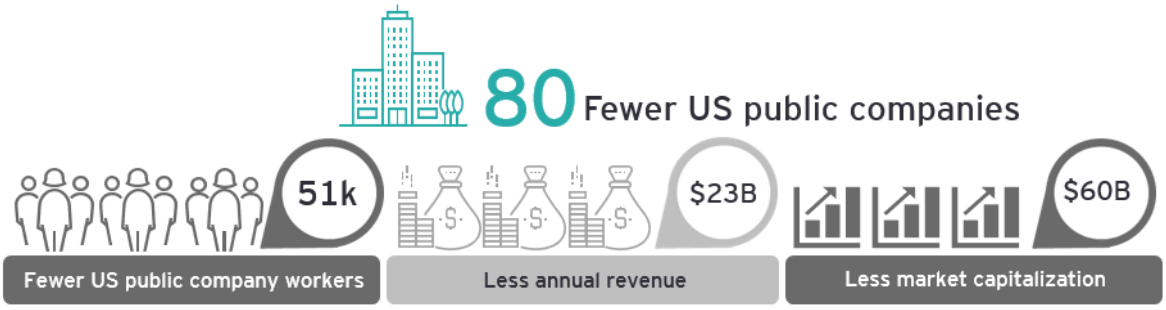
Potential impact of additional reporting requirements

As noted above, mandatory reporting requirements have existed since the 1930s with new reporting requirements being introduced and adjusted over time. This includes new reporting requirements that result in additional cost to public companies as well as relief that reduces cost to public companies. To provide an illustration of the potential impact of additional reporting requirements, this analysis simulates how many fewer public companies would have been listed on major US exchanges at the end of 2019 if reporting requirements were 10% more costly since 2000.[14]

As shown in Figure 4, the analysis estimates that there would have been 80 fewer US public companies listed on major US exchanges at the end of 2019 if the costs of mandatory reporting requirements were 10% higher since 2000. These 80 public companies would have an estimated 51,000 employees, $23 billion in revenue, and over $60 billion of total market capitalization. Specifically, the analysis estimates that there would have been 150 fewer IPOs of US public companies on major US exchanges during the 2000-2019 period if mandatory reporting requirements were 10% more costly. There is a larger reduction in the number of IPOs than public companies because many public companies are acquired by other companies, experience bankruptcy, or delist from exchanges for various other reasons. Additionally, it stands to reason that higher cost increases would translate into higher estimated impacts on listed companies (e.g., a 20% increase in reporting costs over this period would generally double these estimates).

Figure 4. Reduction in number of public companies and workers, revenue, and market capitalization at public companies if mandatory reporting requirements had been 10% more costly, 2019

On major US exchanges



Note: Figures are rounded. Relying on the framework of Ewens et al. (2021), the analysis estimates the reduction of initial public offerings between 2000-2019 from the costs of mandatory reporting requirements. The analysis examines IPO data because the research indicates it is the primary channel that mandatory reporting requirements affects. The analysis assumes the survival rate for the companies that did not go public due to mandatory reporting requirements is the same as those that did go public. The analysis excludes special purpose acquisition funds (SPACs) and financial funds. These companies and the related economic activity do not cease to exist, but rather remain private instead of being public. See appendix for details.

Source: Audit Analytics, S&P Capital IQ, and EY analysis.

III. Caveats and limitations

Any modeling effort is only an approximate depiction of the economic forces it seeks to represent, and the economic model developed for this analysis is no exception. Although various limitations and caveats might be listed, several are particularly noteworthy:

- **Estimates are limited by available information.** The analysis primarily relies on information from Audit Analytics and S&P Capital IQ. This information is based on SEC and other legal filings. The analysis did not attempt to verify or validate this information using sources other than those described in the report.

- **There are significant shortcomings in the economic research quantifying the impact of mandatory reporting requirements.** As noted in a recent review of the literature, Leuz and Wysock (2016), the cost of reporting requirements is difficult to quantify and most research to date has been qualitative or survey based. Qualitative research, by definition, is not quantitative and survey-based estimates have an issue of potential overreporting of costs.

- **Because of the methodology's reliance on changes in reporting requirements at public float thresholds it cannot examine uniform reporting requirements or industry-specific rules.** This analysis relies on the revealed preference framework of Ewens et al. (2021). Specifically, the authors infer reporting requirement costs by examining how much cost companies are willing to incur to avoid increased reporting requirements. This is then used in separate models to estimate the change in the probability of going through an IPO and delisting. There are, however, still significant limitations. Because of the methodology's reliance on changes in reporting requirements at public float thresholds it cannot examine uniform reporting requirements or industry-specific rules. The estimates are, therefore, conservative. The threshold-based reporting requirements examined in Ewens et al. (2021) include scaled disclosure, non-accelerated filing, Section 404 of Sarbanes-Oxley, and Emerging Growth Company under the JOBS Act.

- **This analysis examines the cost of mandatory reporting requirements during the 20 years from 2000-2019.** One reason for the higher regulatory compliance costs is mandatory reporting requirements for public companies. These reporting requirements help investors better understand public companies by providing periodic updates of financial results, possible company risks, and other materials and insight into company performance. However, complying with these reporting requirements can be costly and could disincentivize companies from being public. While this line of research may be suggestive of the impacts of mandatory reporting requirements generally (e.g., other or future requirements), such estimated impacts would depend on the particulars of such requirements; that is, an analysis of historical data may not be perfectly generalizable to other or future requirements.

- **Reduction in number of public companies due to mandatory reporting requirements could interact with other reasons for the decline in the number of public companies.** Over the past few decades, for example, markets experienced a significant shift as private equity, venture capital, and other firms increased the capital available to start-up companies. The increased capital available for companies could allow them to scale their businesses

without accessing public markets. Such a change in the market could make private companies more responsive to mandatory reporting costs when considering whether or not to go public. That is, the results presented in this report should be viewed as all else equal except for the change in mandatory reporting requirements.

- **Estimates assume that the survival rate for companies that did not go public due to mandatory reporting requirements is the same as companies that did go public.** Companies that have an IPO do not necessarily permanently remain a standalone public company. In particular, public companies can be acquired by other companies, experience bankruptcy, or delist from exchanges for various other reasons. This analysis assumes, for each year examined, that companies that would have had an IPO if not for mandatory reporting requirements delist at the same rate as companies that did have an IPO. Absent reporting requirements, the composition of companies that conducted an IPO could change. For example, without reporting requirements, riskier companies may choose to conduct an IPO and subsequently delist at higher rates. This analysis did not adjust the rates at which companies delist.

- **Estimates of economic activity estimated from median of existing public companies.** The analysis uses the median value of existing public companies in 2019 to estimate the economic characteristics of companies that did not have an IPO due to mandatory reporting requirements. Different reporting requirements could lead to different types of companies choosing to conduct an IPO. The analysis does not make any adjustments to account for the possible composition changes that could occur under different mandatory reporting requirements.

- **Estimates exclude SPACs and financial funds.** The analysis excluded SPACs and financial funds. In recent years, private companies turned to merging with a SPAC as a method for becoming a public company.[15] SPACs provide an alternative method to the traditional IPO and companies that would have conducted a traditional IPO could have pursued a SPAC instead.

- **The COVID-19 pandemic and subsequent recession could create outliers.** The analysis only covers the 20 years from 2000-2019. The COVID-19 pandemic and subsequent recession could have created outliers relative to the previous period. Accordingly, while 2020 data are more recent, 2019 data may be a better indicator of future years and are highlighted in this report.

Appendix. Methodology

This analysis estimates how many fewer US companies were traded on major US exchanges due to mandatory reporting requirements for public companies over the 2000-2019 period. Specifically, the framework of Ewens et al. (2021) is used to estimate the impact of mandatory reporting requirements on the probability of companies going public through an IPO or delisting. These probabilities are then applied to data on IPOs and other public companies from Audit Analytics and S&P Capital IQ. As part of applying the probabilities to these data other factors (e.g., companies that IPO could be acquired by other companies, experience bankruptcy, or delist from exchanges for various other reasons) are considered. This is described in detail below.

Impact of mandatory reporting requirements on rate of IPOs and delisting

The number of US companies traded on major US exchanges has declined significantly in recent decades. The decline can come from either a higher delisting rate (i.e., existing public companies delist) or a lower IPO rate (i.e., fewer private companies become public). The economic research indicates each of these channels accounts for approximately half of the overall decline.[16] The economic research offers multiple explanations for this decline, including declining business dynamism, increases in the availability of private equity, increases in merger and acquisition activity, and higher regulatory compliance costs. One of the regulatory compliance costs is increasing mandatory reporting and disclosure costs.[17]

This report estimates how many fewer US public companies were traded on major US exchanges due to mandatory reporting requirements for public companies over the 2000-2019 period. Specifically, this analysis relies on the framework of Ewens et al. (2021).[18] As noted in a recent review of the literature, Leuz and Wysock (2016), the cost of reporting requirements is difficult to quantify and most research to date has been qualitative or survey based. Qualitative research, by definition, is not quantitative and survey-based estimates have an issue of potential overreporting of costs. In contrast, Ewens et al. (2021) relies on a revealed preference framework in the context of SEC reporting requirements.

Specifically, the authors infer reporting requirement costs by examining how much cost companies are willing to incur to avoid increased reporting requirements. There are, however, still significant limitations. Because of the methodology's reliance on changes in reporting requirements at public float thresholds it cannot examine uniform reporting requirements or industry-specific rules. The estimates are, therefore, conservative. The threshold-based reporting requirements examined in Ewens et al. (2021) include scaled disclosure, non-accelerated filing, Section 404 of Sarbanes-Oxley, and Emerging Growth Company under the JOBS Act.

The cost associated with mandatory reporting requirements is estimated as follows. Companies choose the quantity of equity to issue in the public market, *e*, relative to the undistorted level, *z*, to maximize its payoff with the following payoff function:

$$\max_{e} -\Phi(e - z) - k\mathbf{1}_{\{e \geq \underline{e}\}}$$

In particular, Φ, is the capital structure distortion cost (i.e., the cost a company incurs if *e* deviates from *z*).[19] The second term of the payoff function, $k\mathbf{1}_{\{e \geq \underline{e}\}}$, is the cost associated with mandatory reporting requirements. Specifically, when a company's equity is above a threshold for a

threshold-based reporting requirement, $\underline{e}$, the company is subject to cost *k*. Cost is defined as the net of direct costs (e.g., fees to lawyers and accountants and the cost of internal control system), indirect costs (e.g., competition effects, constraints on operating decisions), and benefits (e.g., reduction in a company's cost of capital). Social benefits of reporting requirements (e.g., competition effects and investor welfare) are not included in this net cost.

The capital structure distortion cost, Φ, is based on Binsbergen et al. (2010, 2011):[20]

$$\Phi(e - z) = \frac{1}{2}\beta\eta q z r^2 \left(1 - \frac{e}{z}\right)^2$$

where β is the slope of the debt marginal cost curve, η is ratio of public float to book assets, q is Tobin's Q, and r is the interest rate on debt. Without any reporting requirements it is optimal for a company to choose e is equal to z because there is a cost, Φ, to distorting the capital structure. With reporting requirements companies face a cost that can be reduced by distorting the capital structure such that e is below $\underline{e}$. Therefore, the indifference condition of the marginal company is a revealed preference estimate of the cost of mandatory reporting requirements:

$$k = \Phi(\underline{e} - \bar{e})$$

where $\bar{e}$ is the undistorted equity of the indifferent marginal company. Ewens et al. (2021) estimates $\bar{e}$ using the fuzzy bunching estimator of Alvero and Xiao (2020).[21] The fuzzy bunching estimator compares the distribution around the mandatory reporting requirement threshold (which is not smooth with mandatory reporting requirements) to a counterfactual distribution (which would be smooth without mandatory reporting requirements) to estimate the marginal company $\bar{e}$.

Notably, the cost of mandatory reporting requirements estimated above, *k,* is for the marginal company. This is then extrapolated to other companies with the following approach:

$$\ln k = \ln \bar{k} + \kappa(\ln e - \ln \bar{e})$$

where k is the cost of mandatory reporting requirements, $\bar{k}$ is the cost of mandatory reporting requirements for the marginal company, κ is the elasticity of the cost of mandatory reporting requirements with respect to public float, e is public float, and $\bar{e}$ is public float of the marginal company.

Given these estimated mandatory reporting requirement costs, separate models are used to estimate the change in the probability of going through an IPO and delisting. Specifically, logit models are estimated using maximum likelihood:

$$\Pr(\text{IPO})_{i,t} = \frac{\exp(\beta \ln k_{i,t} + \gamma X_{i,t})}{1 + \exp(\beta \ln k_{i,t} + \gamma X_{i,t})}$$

$$\Pr(\text{delist})_{i,t} = \frac{\exp(\beta \ln k_{i,t} + \gamma Z_{i,t})}{1 + \exp(\beta \ln k_{i,t} + \gamma Z_{i,t})}$$

where $Pr(IPO)_{i,t}$ is the probability that company i will go public in year t, $k_{i,t}$ is the cost of mandatory reporting requirements for company i in year t if it is public, $X_{i,t}$ contains other company-specific characteristics affecting the likelihood of IPO, $Pr(delist)_{i,t}$ is the probability that company i will delist

in year t, and $Z_{i,t}$ contains lagged other company-specific characteristics affecting the likelihood of delisting. The marginal effect from a logit model with a logged independent variable is interpreted as follows: A 1% increase in the independent variable (= k = cost of mandatory reporting requirements) decreases the dependent variable (= $Pr(IPO)$ = Probability of IPO) by the estimated marginal effect (e.g., if a marginal effect were 0.001 then there would be a 0.1 percentage-point decrease since 0.001 = 0.1%).

Overall, removing mandatory reporting requirement costs is estimated by Ewens et al. (2021) to increase post-2000 IPO likelihood from 0.95% to 1.4%.[22] Higher mandatory reporting requirement costs are estimated to generally not have an impact on the probability of delisting.[23]

Note that the reduction in number of public companies due to mandatory reporting requirements could interact with other reasons for the decline in the number of public companies. Over the past few decades, for example, markets experienced a significant shift as private equity, venture capital, and other firms increased the capital available to start-up companies. The increased capital available for companies could allow them to scale their businesses without accessing public markets. Such a change in the market could make private companies more responsive to mandatory reporting costs when considering whether or not to go public. That is, the results presented in this report should be viewed as all else equal except for the change in mandatory reporting requirements.

For additional detail see Ewens et al. (2021).

Estimating the impact of mandatory reporting requirements on the number of public companies

The research finds that the reporting requirements examined impacted a private company's decision to go public and did not have a significant impact on a public company's decision to delist and become private. This indicates that changes in reporting requirements primarily impact IPO rates rather than delisting rates. Specifically, as noted above, removing mandatory reporting requirement costs is estimated to increase post-2000 IPO likelihood from 0.95% to 1.4% and that higher mandatory reporting requirement costs generally do not have an impact on the probability of delisting.

The analysis uses Audit Analytics data to determine the number of US companies that conducted an initial public offering (IPO) on major US exchanges from 2000-2019. The analysis examines IPO data because the research indicates it is the primary channel that mandatory reporting requirements affects. This is then used to simulate a change in the post-2000 IPO likelihood from 0.95% (actual mandatory reporting requirement costs) to 1.4% (zero mandatory reporting requirement costs).

The analysis removes special purpose acquisition companies (SPACs) and financial funds from the sample. SPACs have risen to prominence as an alternative to the traditional IPO method. SPACs raise capital from investors, conduct an IPO, and search for a private company to merge with. Upon merging, the private company is now public and the SPAC ceases to exist.[24] If the analysis included SPACs, the number of IPOs would be approximately 9% higher between 2000-2019 with nearly 50% of those occurring in the five years between 2015-2019. The analysis removed SPACs to focus on traditional private companies choosing to conduct an IPO. Financial

funds allow investors to aggregate capital across many companies or asset classes. While public and tradeable, they are not private companies looking to scale using public markets.[25]

Companies that have an IPO do not necessarily permanently remain a standalone public company. In particular, public companies can be acquired by other companies, experience bankruptcy, or delist from exchanges for various other reasons. This analysis assumes, for each year examined, that companies that would have had an IPO if not for mandatory reporting requirements delist at the same rate as companies that did have an IPO. That is, although this analysis estimates that there were at least 1,500 fewer IPOs of US public companies on major US exchanges during the 2000-2019 period because of reporting requirements, there were only at least 800 fewer US public companies listed on major US exchanges at the end of 2019 because of mandatory reporting requirements.

Specifically, the analysis uses Audit Analytics and S&P Capital IQ data to match major business developments (e.g., bankruptcies, mergers, delistings) and financial information to the public companies after the IPO. Companies that no longer trade on major US public exchanges are then matched to bankruptcy and merger and acquisition data from Audit Analytics as well as merger and acquisition and delisting data from S&P Capital IQ. These companies are considered to have lifespans that matched the earliest event year.[26] Companies that are no longer trading at the end of 2019 but did not have matching bankruptcy, merger and acquisition, or delisting data were manually researched to determine the year the company delisted.

The median "lifespan" (i.e., the time from a private company going public to its first business development that would cause it to stop trading on public markets) of US public companies that conducted an IPO on major US exchanges from 2000-2019 is just over 7 years. Companies that still traded at the end of the sample were counted as having a lifespan from their IPO year until the end of the sample. Being acquired by another company was the most common method by which public companies left the sample.

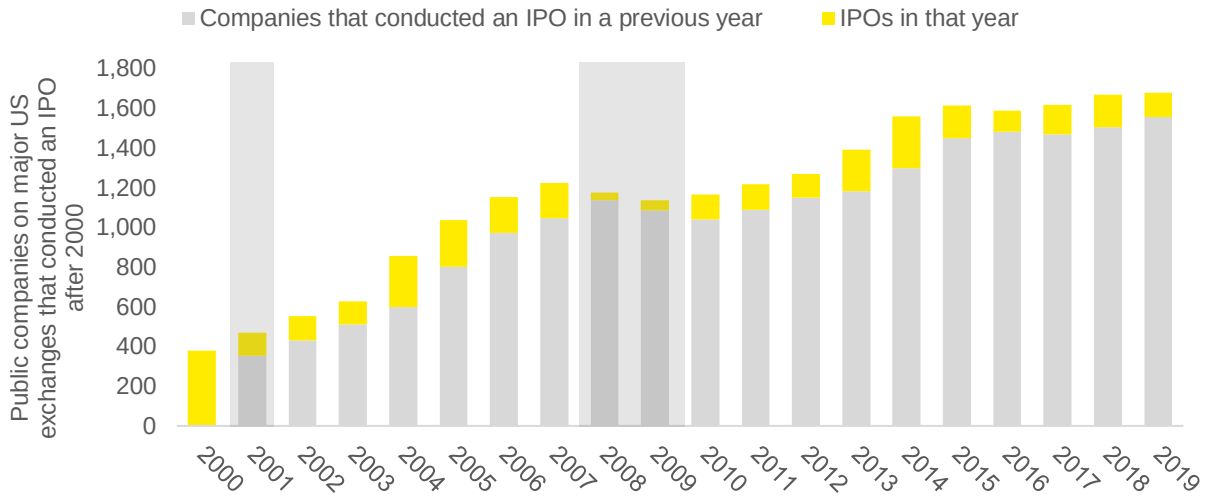
Note that absent mandatory reporting requirements the composition of companies that conducted an IPO could change. For example, without reporting requirements, riskier companies may choose to conduct an IPO and subsequently delist at higher rates. This analysis did not adjust the rates at which companies delist.

These data – public companies on major US exchanges that conducted an IPO after 2000 taking into account major business developments that could result in a public company no longer being a public company – are displayed in Figure A-1. Although over 3,200 companies conducted an IPO since 2000, only approximately half still list as public companies in 2019. Figure A-2 highlights the composition of public companies that conducted an IPO since 2000 based on the year of their IPO. For example, in 2019, of the nearly 1,700 remaining public companies that had an IPO since 2000, 16% had their IPO in 2000-2004, 15% had their IPO in 2005-2009, 31% had their IPO in 2010-2014, and 38% had their IPO in 2015-2019.

The analysis uses the median value of existing public companies in 2019 to estimate the economic characteristics of companies that did not have an IPO due to mandatory reporting requirements. Different reporting requirements could lead to different types of companies choosing to conduct an IPO. The analysis does not make any adjustments to account for the possible composition changes that could occur under different mandatory reporting requirements.

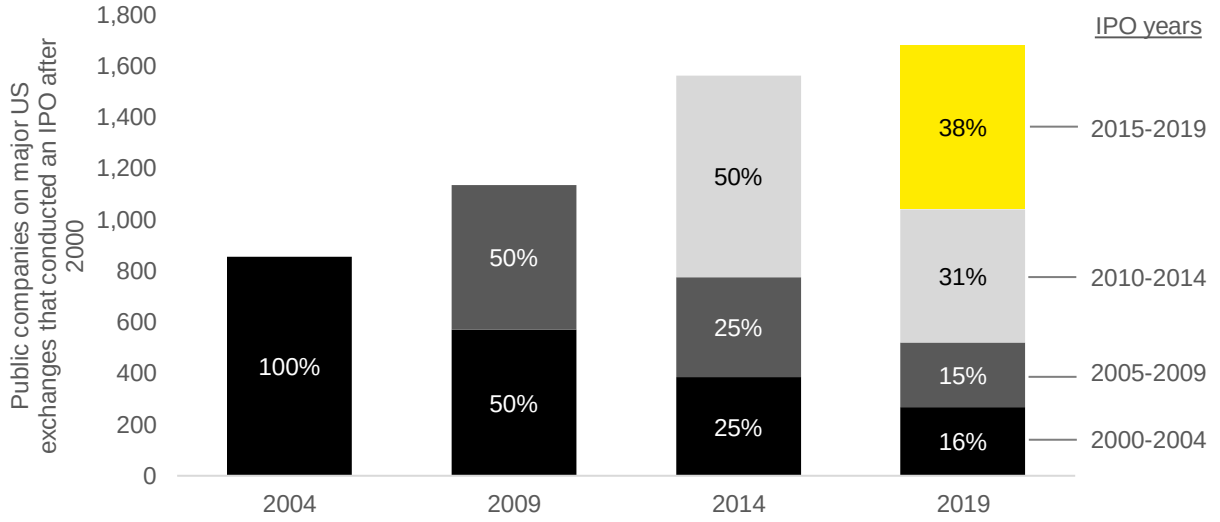
To estimate the median public company in 2019, the analysis uses S&P Capital IQ data on market capitalization, revenue, and total employees from public companies incorporated in the United States.

Figure A-1. Public companies that conducted an IPO after 2000, 2000-2019



Note: Gray boxes are recessionary years. The sample includes only public companies that conducted an initial public offering on major US exchanges from 2000-2019. The figure excludes SPACs and financial funds.
Source: Audit Analytics and EY analysis.

Figure A-2. Public companies that conducted an IPO after 2000 by IPO year, 2004-2019



Note: The sample includes only public companies that conducted an initial public offering on major US exchanges from 2000-2019. The figure excludes SPACs and financial funds.
Source: Audit Analytics and EY analysis.

Endnotes

[1] See, Doidge, Craig, G. Andrew Karolyi, and René M. Stulz, "The U.S. listing gap," *Journal of Financial Economics*, Volume 123, Issue 3, March 2017, https://www.sciencedirect.com/science/article/abs/pii/S0304405X1630232X

[2] The World Bank definition is as follows: "Listed domestic companies, including foreign companies which are exclusively listed, are those which have shares listed on an exchange at the end of the year. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies, such as holding companies and investment companies, regardless of their legal status, are excluded. A company with several classes of shares is counted once. Only companies admitted to listing on the exchange are included."

[3] "World Development Indicators," World Bank website, databank.worldbank.org, accessed June 2022. This value is for 2019.

[4] Other explanations include shifting investment to intangibles and changing economies of scope. As observed by Ewens et al. (2021), non-regulatory factors are generally found to play a more important role. See Ewens, Michael, Kairong Xiao, and Ting Xu, "Regulatory Costs of Being Public: Evidence From Bunching Estimation," NBER Working Paper 29143, August 2021, https://www.nber.org/system/files/working_papers/w29143/w29143.pdf

[5] See, for example, Decker, Ryan, John Haltiwanger, Ron S. Jarmin, and Javier Miranda, "Declining Business Dynamism: Implications for Productivity?" August 2016, https://www.brookings.edu/wp-content/uploads/2016/08/haltiwanger_conference_draft.pdf

[6] See Ewens, Michael and Joan Farre-Mensa, "The Deregulation of the Private Equity Markets and the Decline in IPO," *The Review of Financial Studies*, Volume 33, Issue 12, December 2020, https://academic.oup.com/rfs/article/33/12/5463/5835291

[7] See Gao, Xiaohui, Jay Ritter, and Zhongyan Zhu, "Where Have All the IPOs Gone?", Journal of Financial and Quantitative Analysis, Volume 48, No. 6, December 2013, https://www.cambridge.org/core/services/aop-cambridge-core/content/view/4687B99460F170D9F290EA9EC587B41A/S0022109014000015a.pdf/where-have-all-the-ipos-gone.pdf

[8] While Reg FD does not require specific disclosures, it prohibits selective disclosure of material and non-public information to favored individual's without disclosing to the public as well. SOX strengthened the auditing requirements and requires auditor attestation of certain internal controls. Even though SOX passed in the early 2000s, a recent survey of public companies found that 63% of respondents indicate they spend more effort on SOX compliance since implementation. For further details regarding these rules, see Leuz, Christian and Peter Wysocki, "The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research," *Journal of Accounting Research*, Volume 54, Issue 2, May 2016, https://onlinelibrary.wiley.com/doi/abs/10.1111/1475-679X.12115. For more details on SOX compliance in public companies, see Akinosho, Esi, "Unlocking value beyond compliance in your SOX program: Global SOX survey results," EY, May 20, 2020, https://www.ey.com/en_us/consulting/how-to-unlock-value-from-your-sox-program-beyond-compliance

[9] See Leuz, Christian and Peter Wysocki, "The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research," *Journal of Accounting Research*, Volume 54, Issue 2, May 2016, https://onlinelibrary.wiley.com/doi/abs/10.1111/1475-679X.12115.

[10] The median public company in the sample has $102 million in public float. For additional detail see appendix and Ewens et al. (2021).

[11] There are, however, exemptions for companies below certain thresholds.

[12] The major US exchanges included are the New York Stock Exchange (NYSE), Nasdaq, and OTC markets.

[13] The analysis uses median values from existing public companies to estimate the changes across the 800 fewer public companies in 2019. Due to multiple large existing public companies in 2019, the average could overestimate the size across the 800 fewer public companies.

[14] To illustrate the potential impacts of higher mandatory reporting requirement costs, this analysis assumes that this impact is simply 10% of the zero regulation case as estimated by Ewens et al. (2021).

[15] For more details on the operation of SPACs see, Anani, Karim and Mark Schwartz, "What you need to know about SPACs," March 31, 2021, https://www.ey.com/en_us/ipo/what-you-should-know-about-special-purpose-acquisition-companies

[16] See, Doidge, Craig, G. Andrew Karolyi, and René M. Stulz, "The U.S. listing gap," *Journal of Financial Economics*, Volume 123, Issue 3, March 2017, https://www.sciencedirect.com/science/article/abs/pii/S0304405X1630232X

[17] For more details on reporting and disclosure rules, see Leuz, Christian and Peter Wysocki, "The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research," *Journal of Accounting Research*, Volume 54, Issue 2, May 2016, https://onlinelibrary.wiley.com/doi/abs/10.1111/1475-679X.12115

[18] Ewens et al. (2021).

[19] Ewens et al. (2021) examine three potential channels through which a company can distort its public float downward: (1) reduced investment, (2) increased leverage, and (3) increased inside ownership. Their analysis finds that the most

cost-effective channel through which to distort public float downwards is increased leverage and, therefore, infer regulatory costs based on adjusting leverage.

[20] See Binsbergen, J. H. v., J. R. Graham, and J. Yang, "The cost of debt," *Journal of Finance* 65 (6), 2010: 2089–2136 and Binsbergen, J. H. v., J. R. Graham, and J. Yang, "An empirical model of optimal capital structure," *Journal of Applied Corporate Finance* 23 (4), 2011: 34–59.

[21] See Alvero, A., S. Ando, and K. Xiao, "Watch what they do, not what they say: Estimating regulatory costs from revealed preferences," Working paper 2020.

[22] Ewens et al. (2021), see Table 7.

[23] Ewens et al. (2021) summarize the recent research that finds little evidence on the effect of regulations on going private transactions.

[24] For more details on the operation of SPACs see, Anani, Karim and Mark Schwartz, "What you need to know about SPACs," March 31, 2021, https://www.ey.com/en_us/ipo/what-you-should-know-about-special-purpose-acquisition-companies

[25] The analysis only includes companies that trade on US public exchanges. The analysis excluded financial funds and any IPO that was both classified as "Other financial vehicles" by North American Industry Classification System (NAICS) and contained "trust" in the name of the company. If the analysis included these companies, the number of IPOs would be approximately 9% higher. If both were included, the number of IPOs would be approximately 19% higher.

[26] The data on merger and acquisitions contains both announcement dates, close dates, and last transaction dates. The analysis uses the year from the either the close date from Audit Analytics data or the last transaction date from S&P Capital IQ data. Mergers and acquisitions could start at the end of one year and finish in another leading to an extra year of life in the analysis. To check the sensitivity of the results to this, the analysis examined average life in years from merger and acquisition announcement dates (the earliest) to the average life in years from the close date or last transaction date (the latest). Using the announcement date would make the average life of a public company in the sample just under a month shorter. Both would still be 7 years old.