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Should we worry about the decline of the public corporation? A brief survey of the economics and external effects of the stock market[☆]

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ABSTRACT

In recent years, the number of listed companies has been declining in many countries across the world. This paper provides a selective survey of the literature on the real economic effects of the stock market to assess the potential effects of this decline and determine whether it is likely to continue. The leading economic role of the stock market's primary market, in which firms raise capital by issuing new shares, is to help growing firms secure financing. We discuss providing and certifying information, coordinating investors, and easing the redeployment of capital as the means through which capital allocation can be efficiently achieved. The main economic roles of the stock market's secondary market, the trade in existing shares, is to provide liquidity to shareholders, to aid in price discovery and to provide diversification opportunities. Positive external effects from an active stock market may arise for consumers, labor and private firms due to increased corporate investment, more socially responsible business strategies and a more positive business climate. Negative external effects on capital allocation and productivity can arise from short-termism, market mispricing, and increased cross-ownership. Local stock markets can spur innovation and foreign direct investment (FDI) and reduce the risk of early cross-border acquisitions. Given the myriad of useful economic functions the stock market performs, a future entirely absent of public companies is difficult to imagine and the decline is therefore likely at some point to come to an end. Whether we need to worry about the decline depends on the relative importance of the positive and negative external effects, a topic we feel warrants more research.

1. Introduction

Over the last two decades, the number of publicly listed companies has been declining in many OECD countries. For example, in the United States, the number of listed companies has decreased by half since 1997 (Dojige, Karolyi, & Stulz, 2017; Grullon, Larkin, & Michaely, 2017), with a similar decline observed in the United Kingdom between 1999 and 2011 (Kay, 2012). Could this decline of public companies have a long-term negative impact on financial markets or the broader economy? Despite a growing concern that this decline is harmful, there is no clear consensus (The Economist, 2012).

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To assess this complex issue, we must first understand which economic functions the stock markets fulfil. On a related note, if stock market regulation or other intervention by policy-makers is warranted, it is necessary to understand with which, if any, external effects on the wider economy such intervention could be associated. To this end, we provide a brief survey of the literature exploring the broader role of the stock market and discuss the possible external effects that can arise from the existence of a stock market.

Generally, we take the stock market to mean a formal exchange wherein the shares of listed companies can be traded. Furthermore, we make a distinction between the primary and secondary markets. The primary market refers to the platform for the initial sale of shares, whereas the secondary market refers to the platform for the trade in existing shares. These two markets are closely interlinked; for instance, the demand for the initial sales of shares on the primary market will depend on the liquidity potential investors expect in the secondary market.

To understand the stock market's overall importance in the economy, we emphasize a number of key economic roles played by the primary market, including providing information to investors, coordinating investors, and easing the redeployment of capital between investments. Information provision is central to reducing problems of asymmetric information, which may prevent good-quality firms from raising capital for new projects. Solving coordination problems helps, in turn, to mobilize savings to allow firms to invest at the optimal scale, while the possibility for the redeployment of capital allows specialist intermediaries such as venture capital firms to free up their capital from mature investments and instead reinvest it to support young, growing firms.

Similar to the primary market, the secondary market fulfils its own key economic roles. We emphasize a number of these roles, including providing liquidity, generating price signals, and providing diversification opportunities for investors. Liquidity provision allows investors to provide funding to firms but retain the possibility to quickly, and without substantial costs or loss, retrieve the funds in case of unforeseen circumstances. This ability lowers the capital costs of firms and spurs investment. The trade in the secondary market also generates valuable information in the form of a market price that sends price signals to actors in the market, helping to improve investment decisions. Finally, the secondary market helps with allocating resources to riskier projects because the opportunity for investors to diversify their portfolios allows risks to be spread out across many different investments.

Our discussion of the external effects arising from the existence of a stock market highlights the positive effects of increased investments on research and development, labor, and consumer surplus. A stock market can also enable shareholder capitalism, generate positive external effects on corporate governance from price signals and create positive information externalities on private firms. Furthermore, an active stock market may increase the support of citizens for business-friendly policies or better investor protections, as well as function as a mechanism through which investors can put pressure on firms to behave in a socially responsible way.

However, not all external effects are positive. Research highlights a number of ways in which negative effects can arise from the stock market. These ways include agency costs associated with the separation of ownership and control, the mispricing of stocks (which in turn leads to incorrect investment decisions), managerial myopia, the negative effects of liquidity on corporate governance and an increase in the market power of firms from an increase in cross-ownership.

Finally, we discuss the effects of the local (national) stock market. A key reason for a local stock market to exist is that local companies need investors who are informed about local conditions. Our discussion also notes that local stock markets can spur innovation and foreign direct investment (FDI) but may reduce the risk of unnecessarily early cross-border acquisitions taking place.

2. The rise and decline of the number of listed companies

The number of listed companies around the world appears to decline with varying trends between countries. The largest stock market in the world, the stock market in the US, has seen a decline of approximately 50% since its peak in 1997, reaching a level below that of 1980.¹ Great Britain has experienced a similar decline in the number of listed domestic firms, but with a later peak in the mid-2000.

Not all countries are experiencing declines, however. For instance, Japan has seen a steady increase in the number of listed firms throughout the entire sample period.

Worryingly, since the peak of 44,982 listed companies in 2014, the number of listed domestic companies worldwide has fallen by approximately 6.5% as of 2018. The decline for OECD member countries is even starker, with a decline of approximately 14% from their 25,502 listed companies in 2014 (and 17% since their peak number of listed companies in 2007). These trends are illustrated in Fig. 1.

As the absolute numbers are declining, the market capitalization of companies as a percentage of annual GDP is increasing. From Fig. 2, we can see that despite a dip in market capitalizations due to the financial crisis of 2007–2008, the overall trend is positive.

This result suggests that despite there being fewer listed domestic companies in absolute terms, the companies that are listed are becoming more valuable. Below, we will discuss how the decline in the absolute number of listed firms, as well as the increase in the value of listed firms, may affect the efficiency and social value of the stock market.

¹ In the text, we present data on the number of domestic listed companies. One implication of doing so is that any decline in the number of domestic listed firms may be offset by the number of foreign listed firms, leading the total number of listed firms to remain unchanged or even to increase. For instance, for the US the number of foreign Initial Public Offerings (IPOs) has indeed increased from roughly 1% in 1980 to 20% in 2016 (see e.g. Jay R. Ritter's IPO database at <https://site.warrington.ufl.edu/ritter/ipo-data/>). However, there were too few IPOs in absolute numbers to counter the overall decline in the number of listed domestic firms from 1980 to 2018.

Number of Listed Domestic Companies

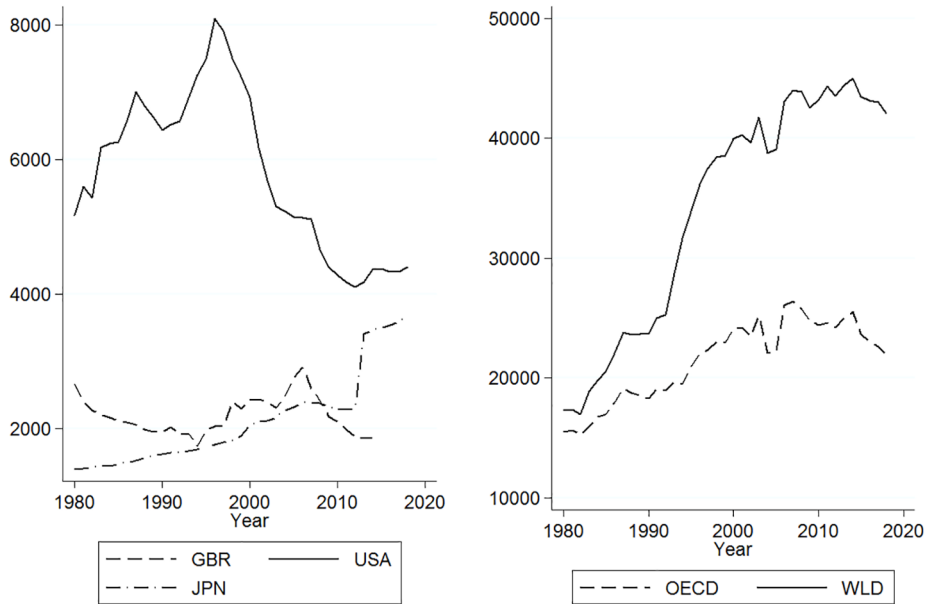


Fig. 1. Number of listed domestic companies between 1980 and 2018. Source: World Bank.

Market Capitalization of Listed Domestic Companies (% of GDP)

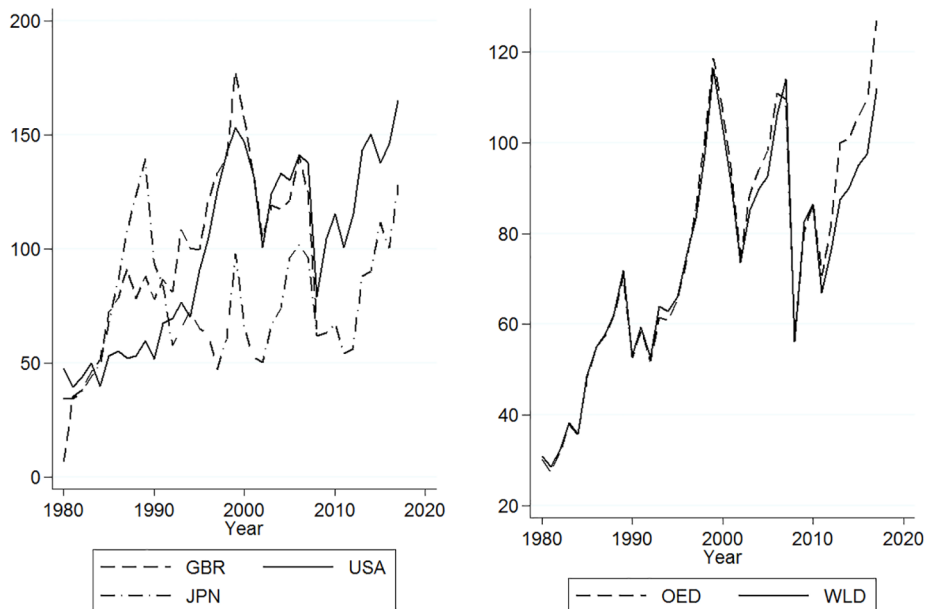


Fig. 2. Market capitalization of listed domestic companies as a percentage of annual GDP between 1980 and 2017. Source: World Bank.

3. Capital provision in the primary market

Industrial development comes from entrepreneurial firms taking large bets on innovative projects, such as unproven technologies, commercialization or scale-up strategies. Not only is firm development risky, it is also costly, and firms may not have enough capital to privately fund such projects. Therefore, acquiring capital from outside investors becomes a prerequisite for the firm to be able to finance its projects and grow. However, even for firms with good projects, obtaining access to capital to finance investments is not an easy process. The primary market is the platform by which firms raise new capital through the issue of stocks. In this section, we underscore three economic functions that the primary market performs that help firms finance new investments: providing

information, coordinating firms and investors, and easing the redeployment of capital.

3.1. Information provision

Investors naturally want to invest only in the firms with the best projects. However, only firms know the quality of their own projects, and they are not necessarily willing to be truthful when trying to raise capital; hence, the issue of asymmetric information between firms and investors arises. Standard economic theory about markets with asymmetric information suggests that market breakdown is a possibility, with bad firms raising more capital than they should and, consequently, good firms raising less capital than they would have if firm quality been perfectly observable (Akerlof, 1970). One way to overcome market breakdown and help the market to function more efficiently is to invest in reducing the information gap between firms and investors.

Intermediaries and regulators of the stock market perform an important role in information provision about firms that wish to list and firms that are already listed. In this way, financial intermediaries may reduce the costs of acquiring and processing information, thereby improving resource allocation (Boyd & Prescott, 1986). Intermediaries that produce better information about firms will fund more promising firms and induce a more efficient allocation of capital (Greenwood & Jovanovic, 1990). Furthermore, intermediaries help reduce informational asymmetries between firms and investors by actively playing the role of a monitor and providing information about firms to potential investors (Easterbrook, 1984; Hansen & Torregrosa, 1992).

In the primary market, when firms are preparing to list, some of the key intermediaries are the underwriters who help list a firm on the stock exchange. When a firm hires an underwriter, the underwriter gathers information about a firm in a prospectus. This prospectus is shown to potential investors to provide them with additional information about the firm. By investing in the gathering of information about companies looking to raise financing, the underwriters can make use of economies of scale in that individual investors are not forced to make these investments themselves (Levine, 2005). However, the quality of the information that the underwriters can gather and how much investors believe the quality to be good may have an impact on how successful firms are at raising capital.

Even without taking intermediaries into account, to list on a stock exchange, firms must often comply with stringent regulations that aim to increase the transparency of firms and protect investors, especially smaller or minority investors. Smaller investors may not have enough resources to monitor the firm's activities in the same way that large shareholders do, and they may not have the same information that insiders do. Unsurprisingly, protecting minority shareholders is critical to the development of a country's capital markets (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997; Glaeser et al., 2001), as countries with stronger investor protections also have better-developed stock markets (Dojidge et al., 2017). In contrast, when minority shareholders lack protection and are subject to expropriation by controlling shareholders, markets for raising new shareholders' equity can break down (Shleifer & Wolfenzon, 2002).

Through their compliance, firms are forced not only to provide more information to regulators and investors but also to show that they can in fact do so. Therefore, regulation directly helps make firms more transparent by requiring that more information be provided and indirectly helps by signaling that firms maintain a certain standard. Studies have shown that in the absence of strong legal protection, firms that wish to lower their cost of raising external capital may seek ways to commit to a higher standard of corporate behavior (Benos & Weisbach, 2004; Ribstein, 2005; Karolyi, 2006), for instance, by listing in a country where legal or investor protections are stronger.

3.2. Coordinating firms and investors

Although firms may want to find investors and investors may want to find firms in which to invest, this desire alone may by itself not lead to the two parties being able to transact because of a failure to coordinate their actions. In an economic system with multiple equilibria, coordination failure occurs when a group of agents could achieve a more desirable equilibrium but fail to do so because they do not coordinate their decision making (Cooper & John, 1988). This situation is one of common interest in the sense that both firms and investors prefer a situation in which they can coordinate and transact to one in which they cannot. For instance, it may be the case that there are several entrepreneurs with business ideas of different scales. There might also be several investors with limited financial resources and the inability to provide enough funds by themselves. In this case, a coordination failure could occur whereby all investors support small firms instead of jointly investing in one large firm that is more profitable.

Society has developed several ways to solve such coordination problems. The most obvious cases involve social norms and rules, e.g., driving on the left side of the road in the UK and Japan. In the absence of explicit rules, individuals may rely on focalness; e.g., Schelling (1980) notes that two people who are supposed to meet each other somewhere in New York city are likely to go to Times Square. In the same way, firms and investors are likely to go to the stock market to transact.

Underwriters in the primary market play an important role by solving coordination failures among investors and ensuring that sufficient capital is raised. Aside from solving coordination problems, mobilizing savings involves overcoming the transaction costs associated with collecting savings from different people and overcoming the informational asymmetries that make investors adverse to the risks associated with investing in a project (Boyd & Smith, 1992; Levine, 2005). Without the mobilization of enough savings, the scale of many firms might be suboptimal (Sirri & Tufano, 1995). Moreover, investors might be interested in financing the project only if enough other investors also contribute capital. By contacting multiple investors and promising to contribute capital should there be too little from other investors, underwriters help solve a fundamental coordination problem in the market.

3.3. Redeployment of capital

The existence of a primary market leads to improved liquidity in the shares of young, growing companies. This improvement allows specialized intermediaries to free up their capital from mature investments and reinvest their capital to instead support young, growing firms (when capital provision to constrained start-ups is scarce). One example that is highly relevant to growing firms is that of the venture capital and angel investor market. This market relies on the availability of good exit options and the presence of a stock market. Such investors typically have a fixed investment horizon within which time the money should be recovered (Lerner & Tåg, 2013); thus, the ability to exit investments is an important factor even before any investment has been made. It should be noted that venture-backed firms often exit through a trade sale in which an incumbent acquires the entrepreneurial firm. However, as shown by Norbäck and Persson (2009) and Norbäck, Persson, and Tåg (2018), the possibility of making an initial public offering on the stock market may increase the sale price. This possibility will increase the share of the surplus going to the entrepreneur and will create incentives for developing entrepreneurial firms for sale (Norbäck et al., 2016).

The example of venture capital firms also highlights the positive effect of specialization in growing firms (Black & Gilson, 1998; Jeng & Wells, 2000; Michelacci & Suarez, 2004). If a well-developed stock market exists, venture capital firms are more easily able to reuse their skills and experience, leading to more firms benefiting from their abilities (Michelacci & Suarez, 2004).

The redeployment of capital within conglomerates can become more efficient if holdings are liquid. If parts of the firm can be spun off through a listing on the stock exchange, conglomerates can redeploy the funds generated through the sale to internally finance positive net present value projects that may otherwise not have received financing. Similarly, going public allows controlling shareholders and founders to diversify their holdings (Pagano, 1993a; Chemmanur & Fulghieri, 1999).

Further, an IPO can help firms change their strategies. After IPOs, firms may experience both an exodus of skilled inventors and a decline in the productivity of the inventors that remain. However, public firms are also capable of attracting new human capital, as well as acquiring external innovation (Bernstein, 2015).

4. Trade in the secondary market

The key purposes of the secondary market are to facilitate the trade of shares in listed companies, as well as to raise additional capital through a seasoned equity offering (SEO), which is a new equity issue by an already publicly traded company. In this section, we discuss three key economic roles of the secondary market: providing liquidity, generating price signals, and providing diversification opportunities.

4.1. Providing liquidity

A key role of the secondary market, as in the primary market, is providing liquidity in the market for shares, that is, the possibility to quickly make a transaction for the purchase or sale of shares without incurring substantial costs or losses. There are several motives for individual investors to trade, including liquidity, information, diversification or simply noise. The need for liquid funds by investors can prompt them to sell off all or part of their holdings to free up liquid funds to be used for other purposes (Brunnermeier & Pedersen, 2009). Investors may also choose to increase or decrease their holdings due to their learning new information about the future of the firm (Sarkar & Schwartz, 2009). Diversification allows investors to spread their risks; changing their holdings in different firms helps investors choose the risk profile that suits them best (Markowitz, 1952).

A key feature of liquid markets is that they allow investors to commit money to projects but still retain the possibility to access that money should they need it due to unforeseen circumstances. Thus, liquidity improves access to financing for firms and promotes economic growth (Foucault, Pagano, & Röell, 2013). Indeed, some scholars even argue that a contributing factor to sparking the industrial revolution was that there was a liquid market in shares in firms (Hicks, 1969). A central effect on firms' investment from improved liquidity is that it lowers their cost of capital because investors are willing to take a lower return on more liquid shares (Levine & Zervos, 1998; Fang, NOE, & Tice, 2009). Consequently, a lower cost of capital induces more investments, and more high-potential projects can be financed. The desire to be able to withdraw money to finance a consumption shock can make people hold safer, more liquid assets in equilibrium as opposed to riskier but illiquid assets (Diamond & Dybvig, 1983; Levine, 1991). If riskier assets become easier to trade and thus more liquid, this trade-off between risk and liquidity breaks down. Finally, high-potential projects that require capital over a long period may need to shift owners over time due to the increased possibility of consumption shocks to the current owners. With increased liquidity, the cost of changing owners is lowered, with more investment in long-run risky projects as a consequence (Bencivenga, Smith, & Starr, 1995).

4.2. Generating price signals

Secondary market prices do not generate any capital transfers for the firm but contain valuable information for market participants. This idea goes back to Hayek (1945), who argued that prices are a useful source of information. The fact that prices will reflect the information available to investors stems from competition among the buyers or sellers of shares. Any investor who has private information suggesting an increase or decrease in the stock price has a private incentive to trade on the information. An increased (or decreased) demand will help push prices to a level where the investor's private information is fully reflected in the current price. This incentive for individuals with private information to profit from substantial mispricing will ensure that the price reflects the information regarding a specific firm. This mechanism, known in economics as the efficient-market hypothesis, has been extensively

studied (see, e.g., Fama, 1970). Although widely believed to hold, there are nonetheless market frictions, such as capital requirements, trading restrictions for institutional investors or transaction costs, that limit the extent to which mispricing can be corrected and information can be incorporated (Shleifer & Vishny, 1997). We discuss the negative aspects of mispricing in Section 4.

A correct market price can be used for the efficient allocation of resources and for the purposes of making decisions that influence the real economy (Fama & Miller, 1972; Grossman, 1976; Grossman, 1978; Grossman & Stiglitz, 1980). Financial markets aggregate information into asset prices, and these prices in turn provide signals of information that are not otherwise found in profit or other reported measures (Thakor, 1996). However, prices in these secondary markets have real consequences only if they affect the actions of decision makers on the real side of the economy. Additionally, even if decision makers do not learn from market prices, they are often party to contracts that are contingent on market prices (Bond, Edmans, & Goldstein, 2012).

A correct market price can lead to improved resource allocation either within the firm or outside of the firm. Inside the firm, the availability of price signals can provide feedback and allow managers to adjust their decisions if the market reacts negatively (Dow & Gorton, 1997). While an individual speculator may be less informed than the manager, the market aggregates the information of many speculators who may be collectively more informed (Grossman, 1976; Hellwig, 1980). Managers can also compensate employees and be compensated themselves based on the stock price (Holmström & Tirole, 1993). Bakke and Whited (2010) find that small firms with low levels of market mispricing make use of the information contained in the stock price. Luo (2005) shows that managers consider stock price movements around merger announcements when they decide whether to follow through on investments or not. Outside the firm, the ability of ownership to be transferred at a low transaction cost allows firms with bad managers and boards to be taken over, which disciplines managers to behave well (Scharfstein, 1988). Phillips and Sertsios (2016) find that publicly traded companies increase their external financing and their subsequent product introductions more than private companies do in response to positive checks.

4.3. Providing diversification opportunities

In the past few decades, technology and competition among financial intermediaries and service providers have played a significant role in decreasing the cost of trading for the average citizen. For instance, an increase in online brokerages, made possible by the internet, has led to substantially lower costs for trading on the stock market. For instance, Turley (2012) notes that the price of trading a typical share has declined from 5% of the share's price in 1975 to 0.1% in more recent years.

By having access to many different securities, investors can more easily diversify their portfolios, thereby reducing their overall investment risk. The simple intuition behind portfolio diversification, which was formalized by Markowitz (1952), is that asset prices are not perfectly related to one another and a decrease in one asset can be offset by an increase in another asset. In this way, investors' risks are spread across many investments.

Even a perfectly balanced portfolio may quickly become suboptimal in practice. If there is a well-functioning stock market, the investor can quickly rebalance the portfolio to once again have the risk-return profile that best suits the investor's specific needs. A financial system that allows agents to hold a diversified portfolio of risky (and possibly high-return) projects fosters a reallocation of savings towards high-return ventures with positive effects on growth (King & Levine, 1993; Acemoglu & Zilibotti, 1997). Further, being able to invest in stocks, similar to being able to put money into the bank, allows investors to move savings from today to the future. Being able to move wealth across time helps investors keep consumption more stable and less susceptible to large increases or decreases (as in, e.g., Merton, 1973).

As we mentioned in Section 1, the absolute number of listed firms appears to be declining, while at the same time, the value of listed firms is increasing. This trend may cause concern, as the portfolio diversification effect is driven largely by the number of different companies' stock (through their expected return and variance-covariance structure) rather than the value of the stock. That is, if the market were to be concentrated in N firms, a portfolio of these stocks would be weaker and worse than a portfolio in which one was to have $N + 1$ firms (Statman, 1987). Therefore, for the stock market to continue to provide diversification opportunities, there must be enough companies listed through which investors can reap the benefits of diversification.

In recent decades, financial innovation has also provided investors with more instruments to invest in than shares of the firm itself. For instance, the most basic stock options give the holder the right but not the obligation to buy the underlying stock for a prespecified price at a prespecified date. As such, the value of the stock option depends on the price of the underlying stock but is considered much riskier. Assets whose payoff depends on the price of other assets are known as derivatives, and per Duffie and Rahi (1995), there were approximately 1200 different types of derivatives being already used in 1974. Some of the benefits of such innovations are that they facilitate risk shifting (Allen & Gale, 1995) and help complete markets (as in, e.g., Cass & Citanna, 1998).

5. External effects on the economy

5.1. Positive external effects

As outlined above, providing information, reducing coordination problems, and improving liquidity all contribute to encouraging corporate investment. Such investments are likely associated with positive external effects on the economy.

First, it has been shown that there may be external effects associated with research and development (R&D) efforts that benefit society in general; several studies find that the private returns to R&D are typically much smaller than the social returns to R&D (Bresnahan, 1986; Griliches, 1992; Jones & Williams, 1998; Hall, Mairesse, & Mohnen, 2010). Acharya and Xu (2017) find that public firms in external finance-dependent industries spend more on research and development and generate a better patent portfolio than

do their private counterparts. Second, innovation and corporate investment tend to stimulate labor demand, which is associated with positive effects on the labor market. Indeed, studies show that investment by firms is partly reflected in higher wages for workers (Blanchflower, Oswald, & Sanfey, 1996; Van Reenen, 1996). Third, corporate investment has positive external effects on consumers. Most listed firms on the stock market compete in concentrated markets characterized by firms with some degree of market power. If entry, or firm expansion through investment, occurs in such markets, quality-adjusted consumer prices will typically fall, and consumer surplus will increase. Indeed, sales, capital expenditures, and other performance variables may exhibit a consistently increasing pattern over the years before and after an IPO (Chemmanur et al., 2009). Moreover, theories of deep pocket predation suggest that financially unconstrained firms can use their financial assets to predate on financially constrained firms. Removing financial constraints can make such predation unprofitable and thus increase consumer surplus (Bolton & Scharfstein, 1990). Public firms provide a large amount of information through their disclosures. In addition, information intermediaries publicly analyze, discuss and disseminate these disclosures. Therefore, public firms may generate positive externalities on private rival firms by reducing industry uncertainty and facilitating more efficient investment into private firms (Badertscher, Shroff, & White, 2013; Foucault & Fresard, 2014; Yan, 2018).

In addition to the positive effects of increased investment, the presence of an active stock market can help build support among citizens for shareholder capitalism, thus encouraging business-friendly policies or better investor protection (Pagano & Volpin, 2006; Ljungqvist et al., 2016). In Ljungqvist et al. (2016), citizens who directly own stock through the stock market are more likely to sympathize with the value of corporate investments for generating growth in the economy. Delisting decisions brought about due to the increased costs of being listed can spill over, leading to a less business-friendly environment and overall harm to the economy. Enabling shareholder capitalism can spill over on all firms in the economy, not only firms that are publicly listed or those that delist.

Furthermore, as discussed in Scholtens (2006), shareholder activism is a mechanism through which investors are able to put pressure on firms to behave in a socially responsible way. Heinkel, Kraus, and Zechner (2001) show in a general equilibrium framework that if there are enough investors interested in holding only green firms in their portfolios, this exclusion results in a higher cost of capital for the excluded firms. If the cost becomes too great, it is cheaper to invest in becoming green and foregoing the penalty to the cost of capital. Haigh and Hazelton (2004) argue, however, that shareholder advocacy and managed investments in the context of socially responsible investment lack the power to create significant corporate change. More recent evidence suggests that there is a direct link between CSR and firms' financing; Bae, El Ghoul, Guedhami, Kwok, and Zheng (2019) show that firms behaving in accordance with CSR reduce their losses in market share when firms are highly leveraged. Goss and Roberts (2011) look at the link between CSR and bank debt, finding mixed evidence, i.e., lenders appear to be indifferent to CSR investments by high-quality borrowers, whereas low-quality borrowers face higher loan spreads and shorter maturities.

Moreover, as mentioned above, price signals have positive governance external effects because managerial compensation can be based on stock prices, which aligns the incentives of the owners and the manager and thus reduces agency costs (Jensen & Murphy, 1990).

5.2. Negative external effects

However, stock markets may also come with negative external effects. First, the separation of ownership and control mentioned by Berle and Means (1932) can lead to widespread agency costs because the incentives of owners and managers become misaligned. Second, the price discovery process may contain biases such that it is more difficult to exploit long-term private information relative to short-term private information (Shleifer & Vishny, 1997). This difficulty causes stock prices to become uninformative regarding important long-run information, which in turn can distort investment decisions. Investment distortions can also occur because not all traders trade on new information. Diversification or liquidity needs can create swings in stock prices that are unrelated to the real actions of the firm, which distort investment if acted upon by managers (Morck, Shleifer, & Vishny, 1990). Third, managers in firms may have incentives to undertake inefficient short-run projects to temporarily boost stock prices to reduce takeover threats (Stein, 1989) or to beat analysts' quarterly forecasts (Graham, Harvey, & Rajgopal, 2005). This short-term behavior can take place at the expense of investing in long-run productive investments (Asker et al., 2014). Finally, liquidity can have negative external effects on corporate governance (Bhide, 1993). If shareholders can easily get out of positions in firms, they do not have an incentive to pay the cost to carefully monitor the management of and be active owners in firms. If shares are illiquid, the shareholders might be willing to take that cost.

There is a recent body of literature examining the effects of partial common-ownership links between strategically interacting firms (Schmalz, 2018). The potential problem with common ownership is that the decision maker in the firm might take rival firms' profits into account when making decisions for their own firm. This approach may reduce the intensity of product market competition because aggressive investment and pricing may hurt rival firms (Gordon, 2003; O'Brien & Salop, 2000). Harford, Jenter, and Li (2011) document the increase in common-ownership links between S&P 500 firms from 1985 to 2005. Azar, Schmalz, and Tecu (2018) and Azar, Raina, and Schmalz (2016) document an increase in common ownership concentration at the market (as opposed to the industry) level in the US airline and deposit banking industries.

It can be argued that the existence of a stock market enables the growth and consolidation of the asset-management sector, leading to more pronounced common ownership. Thus, the stock market may have a negative effect on consumers.

5.3. The value of a local stock market

Most companies that list on a stock exchange do so domestically, but they can increase their market access by cross-listing on a

foreign exchange. The benefit of foreign cross-listing includes improved liquidity, improved reputation, and greater visibility (Foucault et al., 2013). Cross-listings can also be used to strategically bind the company to the requirements of listing on an exchange because companies tend to cross-list in countries with better investor protections (Pagano, Randl, Röell, & Zechner, 2001). A local stock market can stimulate innovation in industries that are more dependent on external finance and that are more high-tech intensive (Hsu, Tian, & Xu, 2014). Moreover, strong shareholder protections and better access to stock market financing may lead to higher long-run rates of R&D investment, particularly in small firms (Brown, Martinsson, & Petersen, 2013).

A key reason for a local stock market to exist is that local companies need local investors who are informed about local market conditions for the market to be efficient. Investors in a country are best equipped to assess the operations of companies in that country because of better local knowledge; therefore, price discovery and price signals might be improved by listing on the exchange in the country in which the firm operates (Foucault & Gehrig, 2008). Indeed, Caglio, Hanley, and Marietta-Westberg (2016) show that firms that list abroad mainly tend to be firms that are oriented towards markets abroad and that originate from countries with low financial development. Thus, there is some benefit from companies listing on a stock exchange that has investors from the country in which they plan to operate.

It was first noted by French and Poterba (1991) and Tesar and Werner (1995) that investors tend to prefer holding domestic equity over foreign equity, even though holding more foreign equity would be associated with higher diversification benefits. Since then, much literature has emerged that attempts to explain the reasons behind what has been called the Equity Home Bias Puzzle (see, e.g., Cooper, Sercu, and Vanpée (2012) for a review of the literature). Levy and Levy (2014) argue that despite the decrease in foreign investment costs, home bias has not decreased and is even likely to persist into the future. A local stock market facilitates local investors to satisfy their preferences for local equity, in turn improving local firms' cost of capital through increased demand.

Trading externalities may help explain why, despite local stock markets providing value to a country, there is a large difference between the size and efficiency of different stock markets around the world. An entrepreneur who goes public runs an increased risk of revealing opportunities to others. This externality can lead to an inefficiently low number of listed firms and generate multiple equilibria when flotation decisions are positively correlated across entrepreneurs. This outcome may occur if entrepreneurs face borrowing constraints or lack liquidity and thus cannot diversify their portfolios unless they go public (Pagano, 1993b).

A local stock market focusing on high-tech start-ups has been argued to have strong positive externalities on the local economy. The ability of the Nasdaq in the US to provide listing companies and venture capitalists with these advantages has been credited for fostering entrepreneurship and consequently helping the sustained productivity growth of the US during the 1990s (Black & Gilson, 1998). The success of the Nasdaq inspired the opening of 'new' markets by several European stock exchanges in the late 1990s. Markets such as the Neuer Markt (Frankfurt) and the Nouveau Marché (Paris) were inspired by the Nasdaq and were set up by local, established stock exchanges with the explicit goal of helping companies with high growth potential go public, raise equity, and mature (Posner, 2005). These 'new' stock markets in Europe have been shown to provide high-growth companies with new opportunities to finance their growth (Bottazzi & Da Rin, 2002). Countries with better-developed stock markets may also exploit FDI more efficiently (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004).

During the last decades, we have witnessed a large number of entrepreneurial firms that reach the world market at a fast pace ('born global firms'). Moreover, high-quality entrepreneurial firms may have strong incentives to sell their business to incumbents before scaling their business (Norbäck & Persson, 2014). Here, the local stock market can work as a display window to attract foreign investors. Moreover, local stock markets can help the 'born to be sold global firms' not to be sold unnecessarily early and thereby encourage a substantial part of the value created to be distributed to local investors, employees, consumers and taxpayers.

6. Concluding remarks

In the last two decades, the number of publicly listed companies has seen a significant decline in many OECD countries. We provide a brief survey on the role of the stock market in the economy and discuss possible positive and negative external effects associated with the existence of a well-functioning stock market. Such a survey seems warranted given the lack of coherent research literature on the real effects of an active stock market; research on the topic seems to have been spread out across multiple branches of economics and finance.

We emphasize that the key economic roles played by the stock market include providing information, facilitating coordination, redeploying capital, providing liquidity, generating price signals, and providing diversification opportunities. Our discussions of the external effects of a well-functioning stock market highlight the positive effects of increased investments on research and development, labor, and consumer surplus. We also emphasize the benefits of stock markets enabling shareholder capitalism and activism for socially responsible business strategies and the positive external effects on corporate governance from price signals. Negative external effects include agency costs associated with the separation of ownership and control, the mispricing of stocks (leading to wrong investment decisions), managerial myopia, and the negative external effects of liquidity on corporate governance. Finally, we note that local stock markets can spur innovation and FDI and may also reduce the risk of unnecessarily early cross-border acquisitions.

Our summary of the literature leads to two conclusions regarding the decline of public firms. First, public firms are likely here to stay despite the recent decline. The stock market plays a central role in capital provision and reallocation in today's society. It is hard to imagine that listed firms would disappear entirely given the myriad of important economic functions that the stock market performs. Being publicly listed may not be the optimal choice for every firm, but it is likely that it will always be optimal for some firms.

Our second conclusion is that stock markets have both fundamentally positive and negative external effects, but it is hard to evaluate their relative importance. The literature on the financial structure of economies focusing on the distinction between bank-

based economies, which are centered on banks as financial intermediaries, and market-based economies, which are centered on stock and bond markets as financial intermediaries, might help. This literature has long debated which system is the most efficient at generating growth, a measure that likely captures a large part of the positive and negative external effects from stock markets. In theory, the financial structure reflects the comparative advantage of intermediaries such as banks and stock markets in mitigating financial frictions (Allen & Gale, 2000). The decline of public firms can thus be a shift away from a market-based financial structure and towards a more bank-based financial structure, and this shift could be an optimal equilibrium outcome due to, for example, technological change. Levine (2002) finds no evidence that either system is positively correlated with growth; therefore, an adjustment towards a more bank-based system may not have any direct effects on growth. This finding is also consistent with the common argument that what is important is that financial markets work, not whether they are bank- or market-based in nature (Levine, 1997; Merton & Bodie, 2005).

Another relevant issue is to what extent the decline of the public market is associated with the rise of alternative forms of private equity capital providers. As Ewens and Farre-Mensa (2018) show, the deregulation of securities laws in the US has made it easier for firms to raise this type of funding, which can explain part of the observed decline of IPOs (see also Lattanzio, Megginson, & Sanati, 2019). Thus, the decline of the stock market need not be accompanied by a worsening ability of firms to raise funding.

However, given that our review has identified potentially large external effects on society of an active stock market, we believe that more research on the determinants of these effects, both positive and negative, seems warranted. More policy-oriented research on how to boost the positive external effects and how to mitigate the negative external effects associated with an active stock market also seems highly warranted.

However, another area for future research would be to investigate the effects on income and wealth inequality of an active stock market. On the one hand, richer people are more active on the stock market; on the other hand, for less wealthy people, the stock market may be a more important tool for diversification. Moreover, more research seems warranted on how digitalization and artificial intelligence development will affect the role played by the stock market. The new technology should provide opportunities for making the stock market more efficient but also cause challenges when the decentralized market becomes a more efficient competitor. Finally, we believe that more research aimed at integrating research from different strands of the literature more closely would be fruitful.

As a brief survey cannot cover all topics, we end with some suggestions for further reading. On the general topic of finance and growth and the structure of financial systems, the survey by Levine (2005) is excellent. For more on market microstructure and liquidity, see Foucault et al. (2013). For more on mispricing, see Baker and Wurgler (2012). Bond et al. (2012) offer a good survey on the price signal effects on firms.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.najef.2019.101061>.

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