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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 achieved efficiently. The main economic role 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 on consumers, labour and private firm due to increased corporate investment, more social 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.

Keywords: External effects; Growth; Productivity, Real effects; Stock market

JEL Codes: G10; G30; L10; L50

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Introduction

In 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 decreased by half since 1997 (Doidge et al. 2017, Grullon et al. 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).

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 which, if any, external effects on the wider economy such intervention could be associated with. 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 where the shares of listed companies can be traded. Further, 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, 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, mobilize savings to allow firms to invest at the optimal scale, while the possibility for 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.

Much like the primary markets, the secondary market fulfils its own key economic roles. We emphasize a number of these, 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 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 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 highlight the positive effects from increased investments on research and development, labour, and consumer surplus. A stock market also enables shareholder capitalism, can generate positive external effects on corporate governance from price signals and can 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 include agency costs associated with the separation of ownership and control, 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 local (national) stock market. A key reason for a local stock market to exist is that local companies need investors informed about local conditions. Our discussion also points out 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.

1 The Rise and Decline of the Number of Listed Companies

The number of listed companies around the world appears to be in decline with varying trends between countries; the USA has seen a decline of roughly 50% since the 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 and had as of 2014 (until which data is available) slightly more listed companies than in 1994, which saw similarly low numbers at 1,747 as compared to 1,858 firms in 2018.

Not all countries are experiencing declines however. Japan for instance 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 roughly 6.5% in 2018. The decline for OECD member countries is even starker – with a decline of roughly 14% from 25,502 listed companies in 2014 (and 17% since the peak number of listed companies in 2007).

These trends are illustrated in Figure 1.

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 USA 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.

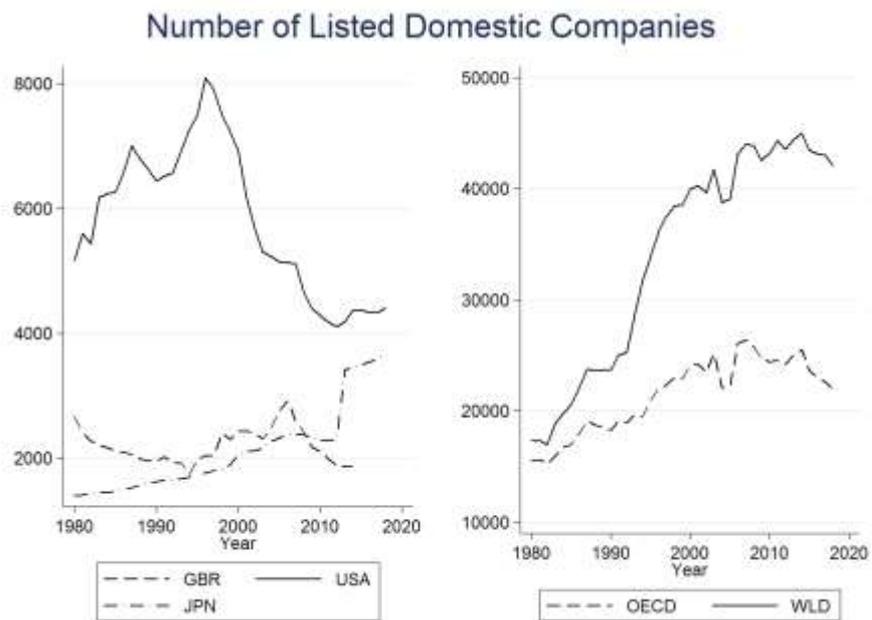


Figure 1. Number of listed domestic companies between 1980 to 2018. Source: World Bank.

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

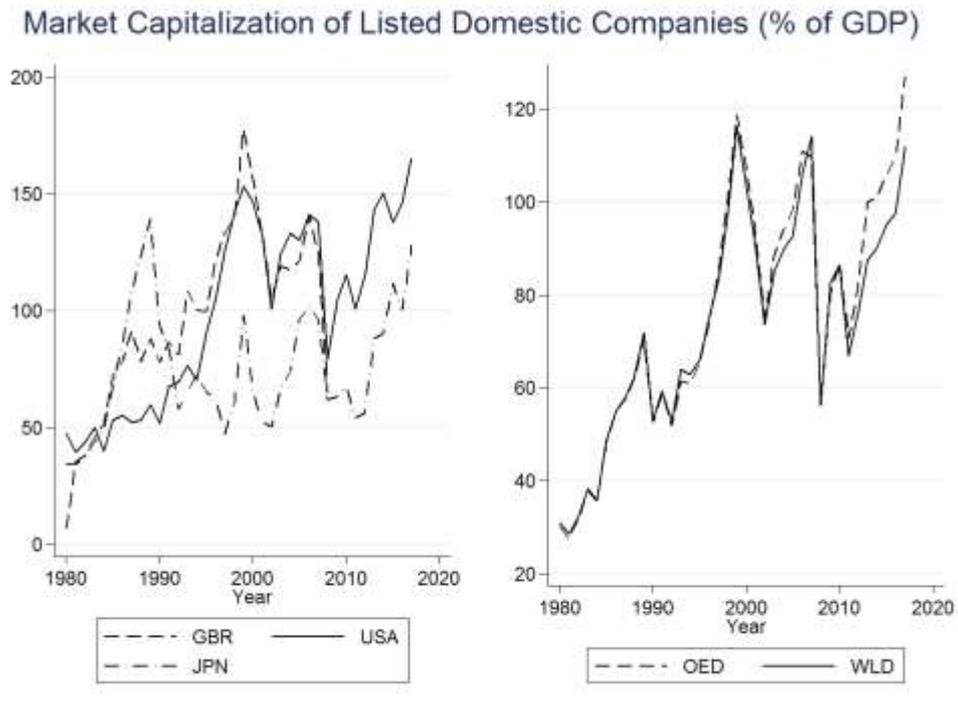


Figure 2. Market capitalization of listed domestic companies as a percentage of annual GDP between 1980 and 2017.

Source: World Bank.

This suggests that despite their 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.

2 Capital Provision in the Primary Market

Industrial development comes from entrepreneurial firms taking big 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, getting 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 the primary market performs that help firms finance new investments: providing information, coordinating firms and investors, and easing the redeployment of capital.

2.1 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 than they would have if firm quality been perfectly observable (Akerlof 1970). One way to overcome market breakdown and help the market function more efficiently is to invest in reducing the information gap between firms and investors.

Intermediaries and regulators on 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 and Prescott 1986). Intermediaries that produce better information on firms will fund more promising firms and induce a more efficient allocation of capital (Greenwood and 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; and Hansen and Torregrosa 1992).

In the primary market, when firms are preparing to list, some of the key intermediaries are the underwriters that 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 gathering information about companies looking to raise financing, they 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 underwriter 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 et al. 1997; Gleaser et al. 2001), as countries with stronger investor protections also have better developed stock markets (Doidge 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 and 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 helps make firms more transparent directly, by requiring more information to be provided, and indirectly, by signalling that they live up to 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 behaviour (Benos and Weisbach 2004, Ribstein (2005), and Karolyi (2006)), for instance by listing in a country where legal or investor protections are stronger.

2.2 Coordinating firms and investors

Although firms may want to find investors and investors may want to find firms to invest in, 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 and John, 1991). This situation is one of common interest in 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 with 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, more profitable large firm.

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 sufficient capital is raised. Aside from solving coordination problems, mobilizing savings involves overcoming 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 and Smith 1992, Levine 2005). Without mobilization of enough savings, the scale of many firms might be suboptimal (Sirri and 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.

2.3 Redeployment of capital

The existence of a primary market leads to improved liquidity in the shares of young, growing companies. This 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, highly relevant to growing firms, is 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 the money should be recovered (Lerner and Tåg, 2013), and 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 where an incumbent acquires the entrepreneurial firm. However, as shown by Norbäck and Persson (2009) and Norbäck et al. (2018), the possibility of making an initial public offering on the stock market may increase the sale price. This 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 and Gilson, 1998, Jeng and Wells 2000, Michelacci and 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 and Suarez, 2004).

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 1993, Chemmanur and 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 inventors that remain. However, public firms are also capable of attracting new human capital as well as acquiring external innovation. (BERNSTEIN, S. 2015).

3 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), 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.

3.1 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 and 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 and 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 it allows 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 et al. 2013). Indeed, some 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 and Zervos 1998, Fang et al. 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 and 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 current owners. With increased liquidity, the cost of changing owners is lowered, with more investment in long-run risky projects as a consequence (Bencivenga et al. 1995).

3.2 Generating price signals

Secondary market prices do not generate any capital transfers for the firm but contain valuable information for market participants. The 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 buyers or sellers of shares. Any investor that 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 markets 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 and Vishny 1999). We discuss the negative aspects of mispricing in Section 4 below.

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 and Miller 1972, Grossman 1976, Grossman 1978, Grossman and Stiglitz, 1980). Financial markets aggregate information into asset prices, and these prices in turn provide signals of information 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 et al, 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 and Gorton 1997). While an individual speculator may be less informed than the manager, the market aggregates the information of many speculators who collectively may be more informed (Grossman 1976; Hellwig 1980). Managers can also compensate employees and themselves be compensated based on the stock price (Holmström and 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 on whether to follow through on investments. 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 in response to positive shocks.

3.3 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, reducing the 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 possible high-return) projects fosters a reallocation of savings towards high-return ventures with positive effects on growth (King and Levine 1993, Acemoglu and Zilibotti 1997). Further, being able to invest in stocks, much like 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 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 weakly worse than a portfolio in which one were to have $N + 1$ firms (Horowitz, (1953), 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 the 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 pre-specified price at a pre-specified 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 and Gale 1995) and help complete markets (as in, e.g., Cass and Citanna 1998).

4 External effects on the economy

4.1 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 and Williams 1998, Hall et al. 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 their private counterparts. Second, innovation and corporate investment tend to stimulate labour demand, which is associated with positive effects on the labour market. Indeed, studies show that investment by firms is partly reflected in higher wages for workers (Blanchflower et al. 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, He and Nandy 2010). 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 and 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, and White 2013 and Foucault and Fresard. 2014 and Yan 2018).

In addition to the positive effects from increased investment, the presence of an active stock market can help build support among citizens for shareholder capitalism, encouraging business-friendly policies or better investor protection (Pagano and Volpin 2006, Ljungqvist et al. 2018). In Ljungqvist et al. (2018), 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 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.

Further, 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 into 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 there is a direct link between CSR and firms' financing; Bae et al (2019) show that firms behaving in accordance with CSR reduces 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 - 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 and Murphy 1990).

4.2 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 and Vishny 1989). This causes stock prices to become uninformative to important long-run information, which in turn can distort investment decisions. Investment distortions can also occur because not all traders trade on new information. However, for other reasons such as diversification or liquidity needs, this can create swings in stock prices unrelated to the real actions of the firm, which distorts investment if acted upon by managers (Morck et al. 1990). Third, managers in firms may have incentives to undertake inefficient short-run projects to temporarily boost stock prices in order to reduce takeover threats (Stein 1989) or to beat analysts' quarterly forecasts (Graham et al. 2005). This can take place at the expense of investing in long-run productive investments (Asker, Farre-Mensa, and Ljungqvist (2015)). Finally, liquidity can have negative external effects on corporate governance (Bidhe 1993). If shareholders can easily get out of positions in firms, they do not have incentives to pay the cost to carefully monitor management and be active owners in firms. If shares are illiquid, they 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 her own firm. This may reduce the intensity of product market competition because aggressive investment and pricing may hurt rival firms (Gordon 2003, O'Brien and Salop 2000). Harford et al. (2011) document the increase in common-ownership links between S&P 500 firms from 1985 to 2005. Azar et al. (2018) and Azar et al. (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.

4.3 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 (Faucault 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 et al 2001). A local stock market can stimulate innovation in industries that are more dependent on external finance and that are more high-tech intensive (Po-Hsuan, Tian, and 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, and Petersen 2013).

A key reason for a local stock market to exist is that local companies need local investors informed about local market conditions for the market to be efficient.

Investors in a country are best equipped to assess the operations of the company in that country because of better local knowledge, so price discovery and price signals might be improved by listing on the exchange in the country in which the firm operates (Foucault and Gehrig 2008). Indeed, Caglio et al. (2016) show that firms that list abroad tend to mainly be firms oriented towards markets abroad and originate from countries with low financial development. Thus, there is some benefit of companies listing on a stock exchange that has investors from the country they plan to operate in.

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, a large literature has emerged trying to explain the reasons behind what has been called the Equity Home Bias Puzzle (see e.g. Cooper, Sercu and Vanpee (2012) for a review of the literature). Levy and Levy (2014) argue that despite the decrease in foreign investment costs, that 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 an increased demand.

Trading externalities may help explain why, despite local stock markets provide 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 may happen if entrepreneurs face borrowing constraints, 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 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 U.S. during the 1990s (Black and Gilson (1998)). The success of Nasdaq inspired the opening of 'new' markets by several European stock exchanges in the late 1990s. Markets like the Neuer Markt (Frankfurt) or the Nouveau Marché (Paris) were, inspired by Nasdaq, set up by local, established stock exchanges with the explicit goal to help companies with high growth potential go public, raise equity, and mature (Posner, 2005). These new 'new' stock markets in Europe have been shown to have provided high-growth companies with new opportunities to finance their growth (Bottazzi and Da Rin 2003). Countries with better-developed stock markets may also exploit FDI more efficiently (Alfaro, Chanda, Kalemli-Ozcan and 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 and Persson (2014)). Here, the local stock market can work as a display window and 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 tax payers.

5 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 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 external effects of a well-functioning stock market highlight the positive effects of increased investments on research and development, labour, and consumer surplus. We also emphasize the benefits of stock markets enabling shareholder capitalism, activism for social 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, mispricing of stocks (leading to wrong investment decisions), managerial myopia, and the negative external effects of liquidity on corporate governance. Finally, we point out 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 performs 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 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 fundamental 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, centred on banks as financial intermediaries, and market-based

economies, centred 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 and Gale, 2000). The decline of public firms can thus be a shift away from a market-based financial structure 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, so perhaps an adjustment towards a more bank-based system may not have any direct effects on growth. This 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 and 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, deregulation of securities laws in the United States have 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, and Sanati 2019). Thus, the decline of the stock market need not be accompanied with 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, 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.

Yet another area for future research would be to investigate the effect 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 towards 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. (2011) offers a good survey on the price signal effects on firms.

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