



Privatization Dragged Out of a Hat as Part of an Economic Toolbox  
– Evidence From A Cross-Country Study

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## Executive Summary

This thesis investigates the role of privatization on improving economic growth. It uses an econometric framework, analyzing a cross-country sample consisting of 142 countries in the period of 1960-2014. It reviews the history of how privatization became integrated into the economic toolbox of stimulating the economy, especially in developing countries. Thereafter, I review prior literature, establishing that the approach followed by this study is original and can contribute positively to the research on privatizations.

This thesis finds clear evidence that privatization overall has a positive effect on GDP per capita Growth, independent of different specifications of the privatization dummy variable. More specifically, the empirical results suggest a positive relationship between the size of privatization relative to GDP and the effect on GDP growth, as the effect of the largest privatizations by volume is approximately one percent greater than the effect of the earliest privatizations. Sampling developing countries also shows that privatization has a positive effect; however, this effect is not as great as for the whole dataset. Dividing the sample into regional subsamples indicates that privatizations in Africa are negative related to economic growth albeit insignificant results, while privatizations are associated with a slight increase in Latin America and the Caribbean and Asia, and an increase of 3-4 percent in GDP per capita growth in richer countries in Oceania, Europe, and North America. In addition, I demonstrate that there is likely to be a bottom threshold, above which privatizations are positively linked to economic growth, and that this threshold lay in the area of middle-income countries and countries, which have high levels of debt but do not suffer from conflicts and have a higher level of development than Least-Developed Countries. Furthermore, the results indicate that the largest privatizations in the competitive and financial sector are associated with economic growth, while the first privatizations point to greater successful privatizations in the energy and manufacturing sector. There are indications that privatizations in infrastructure have a greater effect the larger they are. Lastly, this paper finds little evidence for a negative relationship between privatization and IMF loans.

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## List of Abbreviations

Generalized Method of Moments estimator (GMM)  
Gross Domestic Product (GDP)  
Gross National Income (GNI)  
Heavily Indebted Poor Countries (HIPC)  
International Bank for Reconstruction and Development (IBRD)  
International Development Association (IDA)  
International Monetary Fund (IMF)  
Initial Public Offering (IPO)  
Least Developed Country (LDC)  
Organization of the Petroleum Exporting Countries (OPEC).  
Small- and Medium sized Enterprise (SME)  
State-Owned Enterprise (SOE)  
World War II (WW2)

# 1 Introduction

## 1.1 Motivation

The focus of this thesis is to analyze the effect that privatization has on economic growth across different areas (such as regions and income groups) with emphasis on developing countries. It is common, and maybe natural, to think that developing countries should follow the path of growth, prosperity, development as well as other changes with respect to the role of institutions, democracy, and nature of investments as that of developed countries, such as European countries and the United States. United States is by many portrayed as the leader of the world in many aspects and has been seen as a hegemonic power since World War II (WW2) ended in 1945 (Wallerstein, 2003). It was the one super power that “won” the Cold War as the fall of the Berlin Wall marked its end and that of the communist Soviet Union in 1989, and it has arguably used the International Monetary Fund (IMF) and World Bank as tools through reduction in funding to preserve and promote democracy (C. V Chang, 2006). Moreover, the United States won its freedom from colonial powers and successfully reunited as one country after the American Civil War ended in 1865 under the leadership of Abraham Lincoln.

Looking further back in time, Adam Smith talks about the invisible hand in his book *An Inquiry Into the Nature and Causes of the Wealth of Nations*, published in 1766, where he argues that the market should be running without government interference. At Smith’s time, governments often had monopolies, especially in trade. According to Smith, the economy would improve, if it opened up all markets with little help from the government. If every man does what is in his own interest, the economy as a whole would benefit. In line with the argument of Smith, the famous British economist John Maynard Keynes reported in his 1926 essay *The End of Laissez-Faire* that the government had a distorting role in the economy in 18<sup>th</sup> century.

These days, the role of the government is still highly debated. In the United States and many other developed countries, its role throughout the last decades has been undergoing a transformation of becoming smaller and smaller in terms of size and contribution to Gross Domestic Product (GDP). This is in part due to the recent centrality of institutions and processes to public



policy. Also, some roles that used to be taken care of by the government are now taken care of private corporations and nongovernmental organizations (Kettl, 2000). Pressures on governments to have large budgets have also decreased in the more recent times in high-income countries as it increases the risk of fiscal deficit and a large public debt that could potentially lead to other economic and social problems in the long term. Thus, when some argue for an increase in public spending, it is recognized as coming from a vested interest rather than the public interest (Tanzi and Schuknecht, 1997).

The International Monetary Fund was created together with the World Bank at the Bretton Woods conference in 1944. John Maynard Keynes was present at this conference and successfully argued that countries in economic downturn should pursue fiscal expansionary policies, the classical Keynesian point of view. The mandate of the IMF was therefore to provide money and put pressure on countries to choose expansionary policies over beggar-thy-neighbor policies<sup>1</sup>. This makes IMF act as a lender of last resort for these countries that agree to certain extra conditions for obtaining a loan. Contrary to the initial purpose of IMF, it has had conditions in the past that make countries adopt contractionary policies instead of expansionary policies, e.g. the financial crisis in East Asia (Stiglitz, 2003). Interestingly, the International Financial Institutions Advisory Committee (the Meltzer Commission) and the Council on Foreign relations, both conclude that IMF should not attach conditions to its loans and thereby not seek to intervene and promote economic growth (Vreeland, 2003). Its role in both of the commissions' view were was the IMF to aid countries in times of crisis.

Privatization of one or more public firms is often one of the criteria that IMF sets, believing that this would help the borrowing country improve economically, especially after 1997. That year, the IMF tried to change its mandate to include capital market liberalization. However, it is risky to open up the capital market for a developing country without the necessary regulatory laws needed to maintain a stable, liberalized capital market. Doing this too fast can lead to a severe crisis, as was seen with the financial crisis in East Asia in the 1990s. In reality, the IMF and World

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<sup>1</sup> The goal of beggar-thy-neighbor is to increase a country's exports and decrease its imports, often through currency devaluation and setting up protective barriers.

Bank had already incorporated the so-called Baker Plan, which included privatization of State-Owned Enterprises (SOEs) and state-controlled enterprises (C. V Chang, 2006). Some countries may have privatized too soon, where privatization in reality thus has a negative effect on the economy, opposite of its intentions. The speed of privatization is important as well and past experiences have shown that countries, such as Hungary, Poland, and Slovenia, which privatize at a slower speed, have been more successful in their transitions (Stiglitz, 2003).

## 1.2 Research Questions

The aim of this study is to shed more light on the role of privatization in relation to growth in Gross Domestic Product per capita, and to analyze the effect across regions, industries, and income levels in the period 1960-2014. A dynamic panel model is developed to deal with the complications of this type of panel data. To reach the objective, I examine the following questions:

1) *How has privatization become a tool for politicians in their agenda, and what has the role of IMF been?*

Privatization is widely known and used as a part of debt restructuring programs, as seen recently with Greece in 2015 or to improve the government's budget as well as stimulate the economy (Lovasz and Tugwell, 2015). It is thus important to understand how privatization has come to have such a role.

2) *What is the effect of privatization on GDP per capita Growth?*

An econometrical setup helps establishing what the overall effect of privatization is on economic growth and examining the regional, industry, and income group disaggregation.

3) *What are the policy implications for the future use of privatization as a tool in the political agenda?*

Based on the results, the role of privatization on improving growth in the future will be evaluated.

### 1.3 Scope of Research

This research aims to shed view on the role of privatization from a different angle in the context of development, analyze how the effect of privatization on economic growth depends on characteristics such as region, income, and development level, and to evaluate which political measures can be taken to solve this problem. I conduct my analysis with the use of panel data and an econometrical approach that will explain a statistical relationship between privatization and GDP growth per capita across countries. For this, I have used the data from the World Development Indicators and the Privatization Database, both from the World Bank. I will not look into how firms are privatized, minor privatizations in terms of volume, and privatizations that occurred before 1988 and after 2008.

### 1.4 Outline

The remainder of this study is organized as follows: section 2 describes the history of State-Owned Enterprises and their privatizations in the context of economic growth with possible reasons for privatizing. Privatization has become more and more popular in recent decades and it is therefore important to understand the reasoning behind privatizations in order to understand how to analyze its true impact. Section 3 reviews prior literature on privatization, both in relation to economic growth and firm performance. This helps pinning down which research techniques to use in the analysis and identify which area in the research of privatization this study can contribute. Section 4 explains the research methodology and its technical hitches, and discusses how they can be dealt with, ensuring the final dynamic panel model to be as consistent and unbiased as possible. This section also presents descriptive statistics and describes the reasoning behind the construction of the variable of interest, a privatization binary variable (a privatization dummy variable). Section 5 presents the empirical findings throughout different regression estimations and various robustness checks. It further divides the sample into smaller subsamples to examine the role of privatization across regions, industries, and income levels. Section 6 identifies and discusses limitations of the study. Section 7 evaluates policy implications in the future and concludes the study.

## 2 Background

According to the Merriam-Webster dictionary, to privatize is “to remove (something) from government control and place it in private control or ownership” (Merriam-Webster, n.d.). This is the definition that I will be using as well throughout this thesis, however, as we will see further in the text, my dataset also contains information of firms that are only partly sold, where the state still maintains control. Paul Starr of Princeton University argues that privatization is a fuzzy concept, which evokes sharp political reactions (Starr, 1988). The origins and objectives of privatizations are ambiguous, emerging in the West as an alternative to the increasing size of the State. Some privatizations are used to return services back to the private markets, while others are used to alter market dynamics with hopes to improve the financial performance of the previously State-Owned Enterprise. This means that privatizations are not merely a traditional tool to oppose a larger government. Many people associate hearings of the word ‘privatization’ with the government under Margaret Thatcher that used privatization intensively; more than any other country at the time. SOEs accounted for around 11.5 percent of GDP in the United Kingdom in 1979 when Thatcher won her first election and declined to 7.5 percent by the time she won her third election in June 1987 (Vickers and Yarrow, 1991). Before discussing privatizations, one must look at State-Owned Enterprises and the history of such.

### 2.1 State-owned Enterprises

According to Megginson (2005), there are five reasons for State ownership of an organization or business activity. The first reason is that state ownership can be a natural extension of power, usually in the case of a feudal or tribal society. This offers an explanation for the development of state ownership throughout time, back to the city of Ebla in the Near East around 2500 B.C. (Sobel, 1999). One common way to stay in power was to have large holdings of land and extract rent or taxes. This was also useful combined with fact that the rulers had power to tax, regulate trade, and produce goods on a national basis (Megginson, 2005). Sobel (1999) notes that the government in Ebla was heavily involved in the production process, owning mills that produced cloths and employed its own smiths and the like for the work with metals. At the same time, trade

deals with neighboring States nearly always confirmed the autonomy of each State. Similarly, agriculture was the major source of revenue of the three kingdoms, Egypt, Macedonia, and Seleucid Asia (now Syria) after Alexander the Great's death in 323 B.C. through land ownership, cultivated by peasants who paid an annual rent to the government (Sobel, 1999). This lasted up until the late Middle Ages throughout the world, though this power was nearly absolute in Asia while power was constrained by the Church and competition from smaller private nobles in Europe.

The second reason is that State ownership may emerge as a means to commercialize new technologies that can be complex, vital, and/or expensive. This was particularly true under the Industrial Revolution and because some of these new technologies had military applications, Nation States had great interests into the firms behind the new technologies. In the early twentieth century leading up to World War I, State ownership was increased for the commercialization of telephone communications and many basic utilities and services, such as electricity production and distribution, water and sewage services, and gas distribution (Megginson, 2005).

The third reason is that of failing businesses, where the State takes ownership. This usually happens when the State wishes to preserve the jobs that this failing company provides and/or continue the production of the firm's products. More recently, the Great Recession prompted many governments to take a more active role in economic management. AIG (American International Group) was partly nationalized in 2008 in the United States completely against the American ideology of capitalism and free market. Northern Rock was fully nationalized the same year in the United Kingdom. At the time of the Great Recession, governments all over the world in both developed and developing countries increased fiscal spending, some of which went to nationalizing banks (Verick and Islam, 2010). This has been seen before though at the time of the Great Depression in the 1930s. For example, Istituto per la Rivoluzione Italiana (IRI) was founded in 1934 in Italy to take over the assets of the three largest commercial banks including the industrial firms they controlled. The government in France under Leon Blum in the interwar period tried to nationalize many French industries. Overall, the response to the Great Depression was greater state involvement in the economics of society (Megginson, 2005).

The fourth reason according to Megginson is ideology. For example, communist governments prohibited private ownership entirely, while social democratic governments owned what Megginson calls “commanding heights” of the national economy and allowed private ownership of other firms (Megginson, 2005). The newly elected Labour government after World War II in Great Britain nationalized Bank of England, industries such as coal and steel, civil aviation, as well as public transportation and utility companies. Labour set out to create a welfare, which included the establishment of a state-run National Health Service, as envisioned by the Beveridge Report. When Francois Mitterrand was elected to power in 1981 in France, his government started an intensive nationalization program.

The fifth reason is extreme political factionalism. This means that if the society is divided into groups, either by race, religion, class, or ethnicity, then the group in power can maintain control by placing key industries under State ownership and thereby favor its own members. The most salient political fact for many developing countries was the resentment over colonialism and in this regard, industries dealing with infrastructure were targets for nationalization due to their importance, visibility, and foreign ownership (Noll, 1999). State ownership was part of a plan to spur economic growth in many countries after World War II, especially for China and Sub-Saharan African and Latin American countries; in Latin America, many States used petrodollars<sup>2</sup> to fund large projects and programs.

## 2.2 Privatizations

According to a Price Waterhouse report in 1989, the specific objectives of all governments for privatizing SOEs are similar (Anderson and Hill, 1996). They are to raise revenue for the State; promote increased efficiency; reduce government interference in the economy; promote wider share ownership; provide the opportunity to introduce competition; and to expose SOEs to market discipline (Anderson and Hill, 1996). In many cases, this is driven by a political ideology. Industries in Great Britain that were nationalized after WW2 suffered from two main weaknesses:

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<sup>2</sup> A petrodollar is defined as a U.S. dollar earned from the sale of oil (Oweiss, 1974).

political intervention in the management and a lack of effective corporate governance and accountability of management actions (Parker, 2012).

Privatization became a popular word at the time of Margaret Thatcher's government in the early 1980s. Notable sales included companies such as British Petroleum (1977), British Aerospace (1981), British Telecom (1984), and British Gas (1986). Each of these firms was partly privatized, and they are characterized as some of the most historically significant share issue privatizations with British Telecom setting the world record at the time for the largest equity offering in history, selling for \$4.8 billion (Megginson, 2005). Some countries tried privatization schemes earlier but failed to succeed with many resulting in a subsequent crisis. The German government sold part of Volkswagen in 1961 and VEBA, a chemical firm, in 1965. The sales were initially successful but the public enthusiasm deteriorated when the shares started to decline. The reason was that many of them were held by small shareholders, leading the government to bail out many a large amount (Megginson, 2005). Chile similarly pursued an intense privatization program during the 1970s under the Pinochet government. The State controlled nearly 500 companies in the beginning of the decade and by the end, it controlled only 19. Before the privatization scheme, the Chilean economy had experienced extreme changes with an activist government and an intensive nationalization program, increasing the state enterprise sector fivefold from 1970-1973 (Yotopoulos, 1989). The military government, which came to power in 1973, pursued a liberalization policy, leading to an increase in GDP, averaging 7.2 percent per year in the period 1976-1981 compared to 4.7 percent in the period 1961-1971. However, Chile experienced a crisis in the 1980s, and debt servicing amounted to nearly 80 percent of exports in 1983. Many of the firms that were once privatized were re-nationalized (Yotopoulos, 1989).

The widely popular privatization program by the Thatcher government influenced other countries to privatize. Among these was France which has a history of having a strong State. The newly elected government in 1981 initiated a large nationalization plan concerning 50 firms, taking effect in 1982 (Dumontier and Laurin, 2001). This was an unprecedented move and when Jacques Chirac was elected as Prime Minister in 1986 his new government sold and thereby privatized many of the same firms. Other countries that privatized SOEs during the mid-1980s were Austria,

Belgium, Canada, Chile, Denmark, Holland, Italy, Jamaica, Malaysia, Singapore, Spain, Sweden, and the United States. The largest Initial Public Offering (IPO) in the world at the time was set in Japan where a partly privatization of Nippon Telegraph and Telephone (NTT) was sold for USD \$15.4 billion (Megginson, 2005).

The use of privatization to improve either the economy or the performance of State-Owned Enterprises spread to the rest of the world after 1987, especially developing countries in Africa, Latin America, and South Asia. Many of these firms were sold directly to another firm or an individual, while some were sold through IPOs; Lin and Chen (1996) identify nine broad privatization channels. The number of privatizations increased rapidly during the 1990s and became more and more popular. Total proceedings from privatizations yielded more than \$100 billion worldwide annually for the first time in 1996. In the years to come, this would increase to \$180 billion in 2000 before declining to \$51 billion in 2001 (Megginson, 2005).

### 2.3 IMF and Privatizations

Privatizations have throughout the recent decades become a noteworthy part of the IMF's conditions on its loans to its member countries. Conditions were integrated into loans after the initial members of the IMF, including the United States and the United Kingdom, disagreed on the right to automatic drawing of money from the fund. In the beginning, a member was able to draw 25 percent of its quota in a year automatically before it was subject to inquiry, unless the Fund's holdings of the member's currency was 200 percent of its quota. However, the Executive Board of the IMF changed this when it met in May 1947. Here, it discussed Article V, section 3 (a)(i), which was the prime condition that members had to satisfy if they wanted to draw, and decided that a member's representation could be challenged by the Fund for good reasons (Horsefield, 1969). The role of conditions were set in the years after, where the United States got its way with its view on conditionality as it was the main source of credit to the IMF and was vital for the succession of the Fund (Dell, 1981). Standby agreements, which is when a member starts to discuss with the IMF about its possibility to draw within the nearest future, was the main instrument for conditionality from 1952 onwards. Drawings paid out in installments was introduced in 1956 and



binding performance conditions in 1958<sup>3</sup> (Dell, 1981). The IMF has later adjusted its loans to the economic situation of its member countries through the introduction of the Extended Fund Facility, the Structural Adjustment Facility, and the Enhanced Structural Adjustment Facility. The pressure on IMF to liberalize its conditions for lending led the Executive Board to adopt a new set of guidelines on principality, paying due regard to a country's social and political objectives and the reason for their balance of payments problems into account (Dell, 1981). In addition, the World Bank had similar conditions on its policy-based lending in the early 1980s. Conditions in the 1980s and the 1990s with these type of loans generally addressed short-term problems, such as macroeconomic imbalances (World Bank, 2005). The conditions that the IMF has on its loans are generally seen as more binding compared to those of the World Bank. It strongly monitors and enforces members to comply with specified conditions. Failure to do so may lead to a suspension of the next installment(s) of debt. IMF has made its conditionality requirements publicly available since 1997 and more recent documents have showed that privatization actually was a standard condition of its structural lending (Brune, Garrett, and Kogut, 2004). The idea of including privatization as a condition in its programs is by some attributed to a speech U.S. Secretary of State James A. Baker in 1985 (Polak, 1994).

#### 2.4 What are the Reasons for a Country to Privatize a State-Owned Enterprise?

This section presents the theoretical findings relating to privatizations and State-Owned Enterprises from the owner's point of view in the context of encouraging the firm to perform financially well. This will help give the reader a better view of the logic behind privatizations from the owner's perspective.

A large company suffers from complex agency problems due to multiple and overlapping layers of monitoring hierarchy. This is true for both private and public firms (H. Chang, 2007). However, a public company might have different objectives compared to a private firm, such as the ones mentioned above in section 2.1 and these tend to lead to imperfections at each level of the monitoring hierarchy (Vickers and Yarrow, 1991). This in turn leads to adverse incentives where

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<sup>3</sup> For example, Paraguay was subject to observance of a credit ceiling as well as commitment levels for budget programs and public works programs in the same year.

managers of SOEs face weaker incentives than managers of private firms do. Dixit (1997) presents a model in which a politicization of firms where all stakeholders are seen as principals leads to weaker incentives compared to private firms, which has one principal, namely the ordinary shareholders. The model of Schmidt (1996) shows that the government invests too little in cost reduction and that privatization could be one way to harden the manager's budget constraint. Private firms will replace managers if they do not operate efficiently. The firm might no longer be able to obtain from the suppliers of capital, leading to a bankruptcy or liquidation. A State-Owned Enterprise has the backing of the State that provides subsidies if it is underperforming. Thus, managers face softer budget constraints. In contrast to private firms, bankruptcy is not a credible threat to public managers (Sheshinski and López-Calva, 2003). This means that public firms are not disciplined in the same way as private firms are by the capital market. However, if the government is actively intervening in the market, and it fails to deliver on its policy at the same time, the next government may choose to liberalize the firm as a reaction. In addition, a government could also liberalize if it fears that the company risks failing in the future (Krause and Kihwan, 1991).

Inadequate monitoring is another reason why the State might privatize a company. If citizens own a company, they are likely to suffer from the problem of free riding. The costs of monitoring is often higher than the earnings one owner receives, if he/she has to share the earnings with many other owners but not the cost of monitoring. Many different shareholders experience the problem of asymmetric information, and monitoring is optimally carried out by a single shareholder as economies of scale in the acquisition of information makes monitoring a natural monopoly (Vickers and Yarrow, 1991).

Relaxing the assumption that governments act benevolently will reveal further issues with State ownership (Megginson, 2005). Among these is its role in politics. Jones (1985) demonstrates that there many operational policies lead to the existence of pervasive distributional consequences. For example, politicians might seek to maintain excess employment of SOEs even if this means they operate inefficiently in order to win votes. Furthermore, SOEs in some cases also produce

goods, desired by politicians, or charge prices, which are below marginal costs to win political support (Shleifer and Vishny, 1994).

### 3 Literature Review

#### 3.1 Theory and Growth

The gap between rich and poor countries has been increasing almost exponentially in the last 30 years but actually started to increase long before that. Reinert (2007) estimates that the ratio between the richest and poorest countries was 2:1 in 1750. Pritchett (1997) estimates that this ratio has increased by a factor of five from 1870 to 1990. He finds that the cause of a gap of this size is the difference in the long-run economic performance of two sets of countries; developed countries and developing countries.

Growth theory aims at explaining differences in long-term growth rates between countries. There exists various kinds of growth theories, and they can generally be divided into two dimensions of a scale. In one case, there is the theoretical side where studies are concerned with using assumptions and working out logical implications, and the empirical and descriptive side where studies aim at analyzing growth in a given country at a given time. In other cases, some studies look at short-term growth rates and their fluctuations dealing with short-term factors, whereas others look into how basic factors affect long-term growth rates. A third difference arises in which studies often focus on a group of countries alike at a particular level of development. This has resulted in less-developing countries being generally analyzed at a descriptive level and developed countries at a theoretical level (Sundrum, 1990).

It can be argued that the neoclassical growth theory was developed primarily for the growth of developed countries because of its setting in an industrial economy (Sundrum, 1990). This standard economics approach fails to clearly show how developing countries can grow and does not mention anything about privatizations. In recent years, we have seen some attempts of research on the relationship between privatization and growth. The majority of this consists of empirical research but there also exists few attempts of theoretical models.

### 3.2 Theoretical Literature

This section will look into theoretical literature that investigates the effects of privatization on society from the viewpoint of the State. This differs from that of private investors. In the past, it was difficult to incorporate government into a single equilibrium model with private decision-makers. Thus, often it was assumed that actions of the government were exogenous and happened outside theoretical models. However, after World War II, economists tried to change this. Hugh Dalton noted that the best system of public finance is one, which secures the maximum social advantage from its operations (Colm, 1955). This is in line with Anthony Downs (1957) who writes that a theoretical economic model with an active government must show that the government's actions are both economic and political in nature. Downs (1957) incorporates politics into his model, where political parties formulate their policies as a means to gaining votes. In the model of Shleifer and Vishny (1994), politicians try to influence all firms through bribes and subsidies. Their social welfare function is not first best efficient, as this would require no excess employment nor subsidies. However, the public is organized in a manner to convince politicians into being efficient, resulting in politicians and managers using public money that is not the first best solution for the society, but is efficient between them. Other research also assumes that maximizing social welfare function is an objective for the government (Piketty and Saez, 2013; Saez and Stantcheva, 2013; Svejnar and Smith, 1984; Vickers and Yarrow, 1991).

A question that has battled many economists is whether public or private ownership is more likely to promote social welfare. Laffont and Tirole (1993) look into this and more specifically develop a theoretical model to analyze a specific trade-off between a public enterprise and a private regulated firm. In their model, the cost of public ownership is a suboptimal level of investment because of manager expropriation. This is not the case under private ownership, as the owners do not have social objectives. The cost of private ownership is, however, that managers respond to both the shareholders and the regulators resulting in inefficiency due to conflicting objectives. The model yields ambiguous results concerning the relative cost efficiency of public and private sectors. One of them is that managers of a private regulated firm will invest more in non-contractible investments because the potential rewards are higher. The results lead Laffont and

Tirole (1993) to conclude that: “theory alone is thus unlikely to be conclusive in this respect” (p.654).

Sappington and Stiglitz (1987) look at the choice between providing public and private goods and services, trying to shed new light on the issue of which goods and services should be produced publicly and which should be produced privately. They argue that the government’s main objectives are (1) economic efficiency; (2) equity; and (3) rent extraction. Their model, which includes the fundamental privatization theorem, satisfies these conditions. In this theorem, the government auctions off the right to receive payment for the production. This means that the producer receives payment for the production, equal to the valuation of the output for the government. This way the government can ensure the ideal outcome without knowledge of the production technology. Assuming that the auction was appropriately designed, public production cannot be better than private production. In a practical setting, however, this does not always hold true due to the roles that incentives and imperfect information play in the privatization decision. Sappington and Stiglitz (1987) believe that the main difference between a public firm and a private firm is the transactions costs related to State intervention into delegated production relationships. The government must thus take into account the expected benefits and costs of intervention and the probability that it occurs when deciding whether to privatize a firm. Sappington and Stiglitz additionally conclude that neither public nor private production is preferred over the other in solving the imperfect information problems. In their opinion, the difference in the two types of ownerships affects the transactions costs and likelihood of future interventions into these businesses.

Vickers and Yarrow (1991) look into some of the immediate incentive effects of privatization, such as principal-agent problems between owners and managers such as unaligned interests and asymmetric information<sup>4</sup>. Privatization will shift the objectives of the principals (from state-owned to private). The government has to answer to the public and may be an agent itself. This is not the case of private investors, and thus incentives schemes may differ as well. Rewards can be in the form of share ownership or options schemes under private ownership and poor financial

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<sup>4</sup> Another framework is developed by Hartley and Parker (1991).

performance may result in a takeover by another firm. Problems that arise between managers and the State for a public firm are; (1) the principal does not typically seek to maximize profits; (2) there are no marketable ordinary shares in the firm; and (3) there is no equivalent bankruptcy constraint on financial performance (p. 27, Vickers and Yarrow, 1991). Public ownership gives the government more policy instruments to intervene and correct potential market failures. This may also lead to the public firm functioning suboptimal due to political objectives displacing social objectives like preferring direct political intervention to an “arm’s length” relationship, mirroring the private sector with appropriate managerial incentives. Vickers and Yarrow (1991) conclude that only in the case of stronger managerial incentives, is privatization likely to improve social welfare more than public ownership. More clearly, the model of Bös and Peters (1991) sets forth that a manager’s efforts is chosen efficiently in private firms compared to the manager’s efforts in a public firm and that the manager in a private firm is always rewarded efficiently. They also find that public managers are rewarded more than efficient (less than efficient) in a favorable economic environment (unfavorable economic environment), independent of whether the manager is completely informed about the government’s multiple objectives.

### 3.3 Empirical Literature

This section looks into past empirical studies concerning privatization. We will see that most of the research can be placed into two categories: (1) Privatization and economic growth, and (2) Privatization and firm performance.

#### 3.3.1 Privatization and Economic Growth

The focus of this research is the effect of privatization on economic growth and others before me have already investigated a potential relationship. Some look into the effect in one country (Al-Otaibi, 2006; Kabango and Paloni, 2010; Pitcher, 2012; Yotopoulos, 1989), whereas others look into the effect in a cross-country analysis (Al-Otaibi, 2006; Bennett, Estrin, and Urga, 2007; Nellis, 2005; Plane, 1997; Wallsten, 1999).

One of the earliest studies on the relationship between privatization and economic growth was by Patrick Plane (1997). He uses a sample of 35 developing countries in the period of 1988-1992

and finds that privatizations had a positive effect on economic growth during the period. His finding that the privatization exerts positive effect on economic growth is supported by later studies (Barnett, 2000; Boubakri, Smaoui, and Zammiti, 2009) but contradicts with those of Cook and Uchida (2003). He also identifies macroeconomic policies, such as the government's ability to strengthen institutions, to create a transparent economic environment, and to promote a proper structure of internal prices as determinants of privatizations. Al-Otaibi's (2006) findings are mixed. Using a sample of countries in the Middle East and Latin America, his results show that privatization has a positive and significant effect on all productivity factors in the economy in all sample countries, except for Egypt and Turkey, which experience a negative and significant effect. He suggests that privatization overall is positive but it must be carried out efficiently and each country must follow a unique method in privatization. Bennett et al., (2007) look into three methods of privatizations in a sample of developing countries; by management-employee buy-outs, by sale, and by voucher privatization. Their results show that only voucher privatization exerts a positive, significant effect on growth. Voucher privatization consists of shares being sold at zero or nominal price to insiders and/or outsiders. This may lead to a dispersed ownership structure and weak corporate governance allowing managers to tunnel out assets (Johnson, López de Silanes, La Porta, and Shleifer, 2000). Thus, privatization can be linked to the method for a greater effect on economic growth. The research of Nellis (2005) shows that privatization can also be linked to the regulatory situation of a country. He studied the role of privatization in Africa, surveying empirical studies of the effect of privatization on firm performance. He suggests that institutional improvements are required if African markets are to both attract and retain investors for the benefit of the society, supporting the view of Nellis and Kikeri (1989) who suggest that regulatory changes should precede privatizations and Wallsten (1999) who argues that privatization without attention to regulation may be costly to consumers. This is in part due to the fact that governments spend large amounts of money on subsidies when firms fail to perform but this puts pressure on public expenditures and questions the role of subsidies to SOEs (Plane, 1992; Yarrow, 1999). This is one fiscal reason why governments adopt privatization programs. Another is the possibility of raising a large amount of revenues (Megginson, 2005). How States use the proceeds of a sale is the focus of other studies (Barnett, Davis, Ossowski, and Richardson,

2000; Jeronimo, Pagan, and Soydemir, 2000; Macedo, 2005) including the impact of privatization on public deficits and budgets (Katsoulakos and Likoyanni, 2002). Barnett (2000) finds that the revenues from privatizations tend to be saved and reducing domestic financing. Furthermore, his results show that privatization is positively correlated with higher real GDP growth and lower unemployment. This is not the case for privatizations everywhere as shown by Jeronimo et al. (2000), where the countries of Spain, Italy, Portugal, and Greece experience an inverse relationship between SOE privatization and budget deficits, indicating that the motives of privatization in those countries could have been driven by political and not economic policy.

### 3.3.2 Privatization and Firm Performance

One of the main reasons why a State-Owned Enterprise is privatized is the belief that the firm is inefficient and that it can perform financially and efficiently better by being privatized. Even though it is not the focus of my study, it is still relevant to the role of privatization in regards to economic growth. SOEs are often large firms, employing many people and contribute to the State's fiscal revenues. If these firms fail to present a profit, they often receive subsidies from the State.

Much of the empirical evidence, both studies across countries and those across industries, suggests that private ownership is better than public ownership in general, except for certain situations (Megginson, 2005). According to a study by Megginson and Netter (2001) in which they survey empirical research on privatization, Latin American has embraced privatization, whereas it has been seen as a stealth economic policy in Sub-Saharan Africa. Table 1 in their paper shows an overview of recent studies. Among the findings of studies in the past decade are that full private ownership leads to more efficiency (Boardman, Shapiro, and Vining, 1997) and that State ownership can potentially lower annual rate of long-run productivity growth (Ehrlich, Gallais-Hamonno, Liu, and Lutter, 1994). The research by Boardman and Vining (1989) on the 500 largest non-U.S. firms in 1983 suggests that private firms are superior in terms of economic performance to both SOEs and mixed enterprises where the State owns part of the company. This is in contrast to Kole and Mulherin (1997) who find no significant difference between the performance



of firms after World War II that were under government ownership compared to those under private ownership. La Porta, Lopez-de-Silanes, and Shleifer (2002), however, suggest a negative relation between State-owned banks with growth of per capita income. In addition, they find evidence that government ownership of banks is greater in countries with low levels of per capita income, inefficient governments, and underdeveloped financial systems. When an actual privatization works in developing countries is the focus of the study by Boubakri, Cosset, and Guedhami (2005). They report that performance differs depending on the macro-economic environment. Higher profitability and an increase in efficiency are related to economic growth, and higher levels of investment and output are associated with trade liberalizations. A study conducted simultaneously (D'Souza, Megginson, and Nash, 2005) look at developed countries and also find that privatization improves profitability, output per employee, and real sales. The results of the two studies above suggest that institutional factors as liberalization carries more weight in developing countries.

## 4 Methodology and Data

### 4.1 Methodology

The analysis in this research will be carried out with a dataset consisting of 142 countries, each observed in the period of 1960-2014. All data is collected from the World Bank with the exception of data on schooling, which comes from the Barro-Lee dataset (Barro and Lee, 2010). I will investigate the relationship between privatizations of State-Owned-Enterprises and growth in GDP per capita with the use of econometric model estimations applicable to panel data<sup>5</sup> such as Pooled Ordinary Least Squares (POLS), Fixed Effects, as well as developing a dynamic model, which take account of prior values. I will further investigate whether privatizations have different effects based on regional, income, and industry differences.

Before going into describing panel data, I start with a short introduction to the basic OLS estimation for time series and will follow the notation of Wooldridge (2002). A core assumption for all

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<sup>5</sup> Panel data gives consistent estimates of the true parameter value, if there is a presence of co-integration that may cause spurious relationships among the variables (Baltagi, 2008).

regressions, providing justification for the causal interpretation of them, is called conditional independence assumption or selection-on-observables. This assumes that the observable independent variables are the only reason for a correlation between them and the dependent variables (Angrist and Pischke, 2009). The basic OLS estimation is equivalent to:

$$y = \beta_0 + \beta_1 x_{1a} + \beta_2 x_2 + \dots + \beta_k x_k + u \quad \text{Equation 1}$$

OLS assumes that the sample is randomly chosen<sup>6</sup> from the population and equation (2) shows that the key condition for OLS to be a consistent estimator of the coefficients is that the error has an expected value of zero and is uncorrelated with each of the regressors.

$$E(u) = 0 = E(u|x) = E(u| x_1, x_2, \dots, x_k),$$

$$Cov(x_j, u) = 0, j = 1, 2 \dots K - 1 \quad \text{Equation 2}$$

If the expected value of the error term is zero, conditional on the regressors, we are able to estimate the population regression function:

$$E(y|x_1, x_2, \dots, x_k) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + u \quad \text{Equation 3}$$

If one of the independent variables is correlated with the error term, that variable is endogenous, meaning that it is determined within the context of a model. The reason for this is usually one of three; (1) omitted variables; (2) measurement error; or (3) simultaneity. If the sample suffers from omitted variable bias, one or more variables are missing for a particular reason leading to a failure of the assumption that the error term is uncorrelated with the regressors. This can lead to an over- or underestimation of the effect of one or more of the independent variables. Measurement error is when the recorded observation in the dataset differs from the actual value. This might be the case for me as I use data for developing countries that are likely not to have as precise measures of obtaining statistics as developed countries. However, data from the World Bank is often used in studies involving developing countries (see Acemoglu, Naidu, Restrepo, and Robinson, 2014; Barro, 2003; Papaioannou and Siourounis, 2008) and offer the most reliable data possible. Which one of the three is the reason for endogeneity in a dataset matters less than the

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<sup>6</sup> Countries without sufficient data are left out of the sample, causing an inevitable sampling bias. However, as this is limited, the sample still represents the whole population as good as possible, cf. with Table 4.

fact that there is correlation of the explanatory variables with the error term in development economics (Deaton, 1995). In general, if the error term is correlated with the regressors, one can still obtain consistent estimates with OLS by using heteroscedasticity-robust standard errors. Thus, I use the Huber-White standard errors. These standard errors are asymptotically valid leading to consistent estimators. In addition, one can use proxies, instrumental variables, or indicators of the unobserved variable. The presence of heteroscedasticity does not need to affect one's ability to use OLS for consistent estimation (Wooldridge, 2002). Another way to deal with correlation between regressors and the error term is to use panel data with subscripts for individuals,  $i$ , and time,  $t$ , as in equation (4). This increases the size of data as well as the precision of the estimation.

$$y_{it} = \alpha + X'_{it}\beta + c_i + u_{it} \quad \text{Equation 4}$$

$X'_{it}$  is a matrix consisting of all explanatory variables. The regression techniques will all estimate the coefficients in equation (4). The error term consists of two parts;  $c_i$  denotes the unobservable individual specific effect, while  $u_{it}$  is the remainder disturbance (Baltagi, 2008). The aim is to hold the unobservable individual specific effect constant when obtaining partial effects of the independent variables. This requires the following assumption:

*Assumption 1:  $c$  is time constant over time and has a constant partial effect over time*

The unobserved effect in panel data analysis is often interpreted as capturing features of an individual (Wooldridge, 2002) (or country as in my case). One method to achieve consistent estimates of the coefficients is to take the difference between two periods. The unobserved effect will drop out due to assumption 1 above. In addition, the intercept drops out. Some explanatory variables will also drop out because they are fixed throughout all periods, but if they have some variation over time, it will be possible to consistently estimate the coefficients (Wooldridge, 2002). This framework is called fixed effects or within estimation and it allows the unobserved effect to arbitrarily be correlated with the explanatory variables. If the errors are assumed to be distributed independently of the explanatory variables, the estimation would be called random effects. However, there is little reason to believe that is the case in this study. The reasoning behind this is that the unobserved effect likely differs according to each individual including in cross-

country growth models, applying to cross-sectional units that do not change over time. These can be fixed country characteristics that potentially are correlated with the explanatory variables.

It is intuitive to think that GDP growth in one period partially depends on GDP growth in the previous period(s). Thus, lagged values of GDP growth must be included in the model as explanatory variables. It is in relation to this that Nickell (1981) shows that asymptotic biases are large in first-order autoregressive models estimated by POLS including individual fixed effects. This is the so-called Nickell bias and occurs in a finite panel data. The Nickell bias approaches zero as the time horizon increases to infinity at a rate of  $1/T$  (Alvarez and Arellano, 2003). The question is then; when is  $T$  large enough for the bias to be substantially small? The bias is estimated to be around a downward bias of 2-3% for lagged dependent variables when  $T = 20$ , around 1-2% when  $T = 30$ , and even less for the other explanatory variables (Judson and Owen, 1999). The average number of estimations per country in my dataset is  $T = 36.86525$ . This can be fixed via the use of a difference and a system Generalized Method of Moments estimator (GMM), developed by Arellano and Bond (1991) and Arellano-Bover/Blundell-Bond (Arellano and Bover, 1995; Blundell and Bond, 1998), respectively. GMM estimators require fewer assumptions and have techniques to isolating useful information (Roodman, 2009b). The two estimators are designed for panel data with few time periods and a large number of individuals, and the use of them in a panel data with many time periods and individuals carries the risk of generating invalid results that appear valid and false-positive results by default. Thus, the results generated by GMM estimators should be rigorously tested for sensitivity to a reduction in the number of instruments (Roodman, 2009a). With earlier results showing that the bias is very little in a dataset like mine, and the belief that the bias of 1-2 percent is not large enough to alter the results significantly, this study uses a dynamic panel model dealing with the idiosyncratic errors that may have serial correlation in a different way. GMM estimators will not be used throughout the analysis<sup>7</sup>.

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<sup>7</sup> GMM test results yield invalid and different results when changing the specifications of the model, such as number of instruments, inclusion of lagged values, and endogenous variables.

Furthermore, I substitute the privatization variable with a variable called “Use of IMF Credit” in section 5.6. The reason for this is that IMF has included privatizations as part of its loan conditions (Brune et al., 2004) and particular in Africa where 34 countries had World Bank projects or project financing agreements, which included privatization, by 1998 (Harsch, 2000). Use of IMF Credit denotes members’ drawings on the IMF, which are not drawn against the country’s reserve tranche position, and includes the loans mentioned in the section 2.3. It is thus likely to be good proxy for the significance of privatization because of the expected positive relationship between Use of IMF Credit and the scale of privatization. We have recently seen in the news that IMF still imposes privatization conditions on borrowing countries today by the privatization conditions that Greece accepted when negotiating with its creditors, the so-called “troika”, which consists of the IMF, World Bank, and the European Union (Lovasz and Tugwell, 2015).

## 4.2 Data

I have mainly used data from the World Development Indicators and the Privatization Database, both from the World Bank, but have also used data on secondary schooling by Barro and Lee (2010)<sup>8</sup>. The dataset is strongly balanced and uses a methodology that allows for comparisons between countries through a standardized approach of collecting data from each country (World Bank, 2015c). Even though there are some discrepancies of data availability and collection from country to country, the World Development Indicators will work as a reliable data source, especially for developing countries, where data collection is not as advanced as in developed countries. Merging the two dataset means that I have a dataset of 142<sup>9</sup> countries in the period 1960 to 2014. A list of all countries is presented in the appendix, sorted by region.

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<sup>8</sup> Data is available for every 5 years. Linear interpolation is used for the values in between. Values after 2010 are estimated values. All countries are expected to grow linearly from 2010-2014 as in the period 2005-2010. Barro-Lee uses data on schooling for people 15 years and older as in many countries, people start to work when they are 15. Not including them will underestimate the amount of human capital.

<sup>9</sup> Jamaica and Myanmar have one and zero observations of GDP values, respectively, so they are dropped from the sample.

My privatization data consists of two datasets, one from 1988-1999 (privatizations in 65 countries), and the other from 2000-2008 (privatizations in 102 countries). Both base the year of privatization on the announcement, as the actual flow of receipts may take several years. Privatization transactions are only included in this dataset, if they are worth at least US \$1 million and generated revenue for the government resulting from partial or full divestitures, concessions, management contracts, and leases divestitures (Kikeri and Kolo, 2005). It excludes voucher privatizations and other schemes in case it did not generate revenue for the government. Notably, it provides information on country, company name, year of divestiture, proceeds in million U.S. dollars, and the sector that the firm operates in (World Bank, 2015b). The World Bank does not have information on privatizations in developed countries, except for middle-income countries, but since those economies are more diverse, a privatization is likely to have a smaller effect on GDP growth. I therefore do not expect the results of this study to alter meaningfully.

I use a list from the United Nations to divide all countries up into 5 regions (Department of Economic and Social Affairs, 2010). These regions are Africa, Asia, Latin America and the Caribbean, Oceania, and More Developed regions<sup>10</sup>. I will rely on this to analyze privatization across regions. The number of countries per region is summarized in table 1 below.

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<sup>10</sup> Consists of European countries and Australia, Canada, Japan, New Zealand, and United States of America.

*Table 1 – List of Country Groups*

<b>Region</b>	<b>No. of countries</b>
Africa	37
Asia	38
Latin America and the Caribbean	24
Oceania	3
More developed regions	40
sum	142

Moreover, I use a list of developing countries from The International Statistical Institute to identify developing countries (International Statistical Institute, 2015). It defines developing countries in 2015 as those with Gross National Income (GNI) per capita per year of US\$11,905 or less<sup>11</sup>. I also use a list of country groups by the World Bank<sup>12</sup> for dividing my sample into groups according to their income (World Bank, 2015a). The simple method assigns each country into a low-, middle-, or high-income group<sup>13</sup>. This list also has information on which countries receive support from the International Bank for Reconstruction and Development (IBRD) and from the International Development Association (IDA). Whether a country is eligible for IBRD support is primarily determined by its per capita income and creditworthiness<sup>14</sup>. IDA support depends on relative poverty, defined as GNI per capita below a threshold (US\$1,215 in fiscal year 2016)<sup>15</sup>. In most cases, countries are eligible for support from either IBRD or IDA, thus meaning that majority of IBRD support goes to countries with higher than GNI per capita of US\$6,675. Moreover, I use the following categories, Least Developed Country (LDC), Fragile and Conflict Affected Situations, and Heavily Indebted Poor Countries (HIPC) from the World Bank for a more diverse view of the effect of privatization. Below is a list of the number of countries in each group. Please see appendix for a more detailed list of the various groups of countries.

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<sup>11</sup> Countries with GNI slightly over US\$11,905 are considered to being developing countries.

<sup>12</sup> Updated July 2015.

<sup>13</sup> Based on GNI per capita with the following bands in 2014: low-income countries (US\$1,045 and less), middle-income countries (US\$1,045-12,736), and high-income countries (US\$12,736 and more).

<sup>14</sup> Other factors such as size, as for small island economies, may determine access to IBRD support.

<sup>15</sup> According to the World Bank, some countries with GNI per capita above the threshold may also receive support from IDA, if they lack the creditworthiness needed to borrow from IBRD. Those countries are excluded, though from this analysis.

*Table 2 – List of Income Groups*

<b>Category</b>	<b>No. of Countries</b>
Low Income	20
Middle Income	70
High Income	52
IBRD Only	51
IDA Only	37
LDCs	27
Fragile	17
HIPC	29

In addition, I have information for the sector in which the corresponding privatization took place from same database as the privatization data. The privatizations<sup>16</sup> are divided into the following sectors<sup>17</sup>:

*Table 3 – List of Sectors*

<b>Sector</b>	<b>Largest Privatization</b>	<b>Earliest Privatization</b>
Competitive	5	8
Energy	8	2
Financial	6	9
Infrastructure	64	37
Manufacturing	3	17
Other	1	9
Primary	1	0
Services	3	9
Telecommunications	1	1
Sum	92	92

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<sup>16</sup> The different privatizations will be explained later in the text.

<sup>17</sup> The appendix explains the sectors in more detail.



### 4.3 Privatization as a Dummy Variable

Previous research has used different methods of privatization in studies regarding privatizations. For example, Barnett (2000) uses privatization proceeds accrued to the budget and total privatization proceeds. Boubakri et al. (2009) use total proceeds from privatizations as a percentage of GDP as a proxy for total volume of privatization sales. Other researchers use privatization data to create a binary variable taking the value of one or zero depending on whether a country in some way experienced privatization. The earliest study was by Plane (1997). The variable in his study is equal to one if a country implemented a privatization program in the period of 1988-1992. He also narrows this down to the 12 most successful countries via a threshold comparing cumulative revenue of privatization of 1% of GDP in 1990. Bennett et al. (2007) use dummy variables for analyzing the effect of three different measures of privatization – sale, voucher, and management-employee buyouts – on growth in transition economies and when they were adopted. The variable takes the value of one in the year when the respective measure was adopted and in the years afterwards. Al-Otaibi (2006) uses a similar approach in his study of 15 countries. He, however, does not differentiate between full, mass, or mixed privatization but combines them into one variable. The privatization variable is equal to zero in the period 1980-1990 and equal to one in the period 1991-2001 for all countries. Cook and Uchida (2003) follow the approach used by Plane (1997), but they drop using privatization as a dummy variable because they reason that it cannot convey information in the regression of the magnitude of privatization.

For my privatization variable, I follow a similar approach used by Bennett et al. (2007) who uses time-specific dummy variables for the methods of privatization. Each value takes the value of zero in all years prior to the privatization and the value of unity in the year that the privatization occurs and all years thereafter. I obtain one privatization record equal to the largest privatization per country. The year, when the privatization occurs, is converted into a dummy variable with the value of zero in the prior years and one in that year and the years thereafter. The approach of using the largest privatization observation differs from Bennett et al. (2007), where privatization starts in the year when a country adopts one of the three privatization methods. The appendix shows a detailed list of the countries that privatized.

*Assumption privatization dummy variable no. 1: A country is “privatized once”, equal to the same year it earns the largest revenue of the sale of a State-Owned Enterprise*

The reason for this assumption is that privatization has had a significant role in the rise of globalization after World War II and that States have used privatizations as part of their political agenda. This shows the importance of privatizations that may happen for many different purposes<sup>18</sup>. As mentioned earlier, SOEs tend to be large firms, employing many employees and have significant macroeconomic impact. It can be debated whether the largest privatization in a country will be so important that my assumption is valid. I argue that this is the case due to two reasons: (1) SOEs in developing countries carry a larger weight in the national economy than in developed countries due to less diversified contributors to GDP; and (2) The privatizations in the Privatization Database range from approximately 0.04% -22% of GDP and only a fraction of them are full privatizations. Thus, by creating a dummy variable, I give the privatizations more weights than what they originally appear to have, incorporating the multiplicative effect on economic growth. I also create two extra versions of the privatization dummy variable as a robustness check and observing for the virtue of that fact that the above assumption might not hold for all countries. I also take into account that empirical cross-country regressions with GDP growth as the dependent variable are sensitive to the model specification (Levine and Renelt, 1992).

The construction of the dummy variables above and the opportunity to divide the whole sample into subsamples allows me to test the following hypotheses:

*Hypothesis 1: Privatization has a positive effect on economic growth.*

*Hypothesis 2: The effect of privatization on economic growth differs across regions and income levels.*

*Hypothesis 3: Privatization indirectly affects economic growth through other channels.*

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<sup>18</sup> For a list of historically significant share issues privatizations in the world in the period 1963-2000, see table 1.2 in Megginson (2005).

#### 4.4 Descriptive Statistics

Table 4 shows descriptive statistics of my control values as well as the dependent variable, GDP per capita Growth. I divide it up into two categories: (1) countries with privatizations and (2) countries without privatizations. We can see in my dataset that there are more countries with privatizations than countries without, 91 and 51 respectively. The former group of countries has generally experienced a lower economic growth in the period than the latter, showed by the variable GDP per capita Growth (1.765 % vs. 2.135 %). The difference is remarkably clear and do not statistically overlap (with a difference of 0.37 percentage point on average in the mean growth), indicating countries that privatized and those that did not have in fact experienced two different growth paths, in line with earlier research (Pritchett, 1997; Sundrum, 1990). This is not surprising as 77 of 91 privatizing countries are developing countries, which did not enjoy as high growth after WW2 as developed countries. In addition, many developing countries were under colonial rule and did not achieve independence until after WW2, in some cases up to decades after. Initial GDP is more than five times as large for countries without privatizations as the ones with. This supports the history that shows privatization programs being promoted in developing countries as a means to facilitate growth (Brune et al., 2004). Even though developed countries, e.g. United Kingdom, France, and Germany, implemented privatization programs in the past, many of them have done this before the beginning of the privatization data, 1988. Trade is on average 66 percent of GDP (88) for countries with privatizations (countries without privatizations). This is an indication that GDP is more concentrated on domestic production in countries with privatizations and that privatizations are thus likely to have a greater effect than a simple one-time revenue for the state. Poorer countries tend to specialize in fewer sectors (Koren and Tenreyro, 2007) and these are often in sectors, such as agriculture, which are sensitive to aggregate shocks and where growth is restricted. Sooner or later, comparative advantages in sectors like agriculture will diminish (Reinert, 2007). Reinert coined this difference in development in the same book in this way: “Rich countries specialize in man-made comparative advantages, while poor countries specialize in nature-made comparative advantages” (p.111).

We can also see that countries with privatization are primarily developing countries by the other variables, Average Years of Schooling, Use of IMF Credit, Life Expectancy, and Population

Growth. Developing countries have less educated people, are more likely to have IMF loans and larger amounts, have lower life expectancy, and have higher population growth. The results are as expected. I present the correlation between my variables to control for multicollinearity in the appendix. There are no variables that are correlated out of the ordinary, except for the different privatizations. This will not be a problem as those variables are mutually exclusive and will only be used separately.

*Table 4 – Descriptive Statistics*

Countries with Privatization	(1)	(2)	(3)	(4)	(5)
	N	mean	sd	min	max
Initial GDP	5,115	2,113	2,788	121.2	17,241
GDP per capita Growth	3,967	1.765	6.132	-105.1	70.69
Investment	3,982	21.63	8.249	-5.740	74.82
Government Spending	3,943	14.39	5.935	2.047	64.39
Trade	4,000	66.83	38.59	4.983	280.4
Average Years of Schooling	5,115	5.003	3.151	0	13.46
Use of IMF Credit	3,160	6.019e+08	1.924e+09	0	2.885e+10
Life Expectancy	4,984	61.44	10.41	26.76	80.28
Population Growth	5,082	1.890	1.283	-7.597	11.18
Natural Logarithm of GDP	4,059	23.32	1.85	18.31	29.29
Countries without Privatization	(1)	(2)	(3)	(4)	(5)
	N	mean	sd	min	max
Initial GDP	2,695	11,146	13,851	241.8	74,832
GDP per capita Growth	2,346	2.135	5.139	-69.79	65.06
Investment	2,218	23.61	7.460	-13.41	70.23
Government Spending	2,357	16.96	6.250	2.058	86.91
Trade	2,460	88.27	65.23	0.309	455.3
Average Years of Schooling	2,805	6.834	3.259	0.340	15.48
Use of IMF Credit	616	2.250e+08	5.210e+08	0	3.987e+09

Life Expectancy	2,750	68.41	11.61	19.50	83.83
Population Growth	2,799	1.790	2.036	-3.479	17.48
Natural Logarithm of GDP	2,399	27.73	2.51	18.46	30.33

Notes: The table summarizes the dependent and control variables, separately for countries with privatization and countries without privatization according to whether the country has a minimum of one privatization record in the Privatization Database from the World Bank.

## 5 Empirical Findings

In this section, I provide my baseline results using linear regression models for analyzing the effect of privatization on GDP growth in the sample period 1960-2014. All equations are clustered by country. This allows the standard errors to be correlated within clusters and remain independent across clusters (Cameron and Miller, 2015).

### 5.1 Baseline Results

My main regression model takes the following form<sup>19</sup>:

$$\begin{aligned}
 g_{i,t} \equiv & \alpha + \beta_1 \ln(GDP)_{i,t-2} + \beta_2 Investment_{i,t} + \beta_3 Average\ Years\ of\ schooling_{i,t} \\
 & + \beta_5 Trade_p_{i,t} + \beta_7 Government\ Spending_{i,t} + \beta_8 Privatization_{i,t} \\
 & + \alpha_i + \eta_t + v_{i,t}
 \end{aligned}
 \tag{Equation 5}$$

$g_{i,t}$  is equal to the logarithmic growth rate of GDP per capita, multiplied by 100 for easier interpretation<sup>20</sup>.

$\ln(GDP)_{i,t-2}$  is the second lag of the natural logarithm of GDP per capita. This is to control for convergence also known as the catch-up effect, which says that developing countries have a tendency to grow faster than industrialized countries<sup>21</sup>.

<sup>19</sup> The statistical software, Stata, reports an arbitrary intercept for fixed effects estimations. The intercept is constructed in a way that makes the means of the independent variables equal to the mean of the dependent variable.

<sup>20</sup> GDP per capita Growth is the dependent variable in all estimations, unless otherwise specified.

<sup>21</sup> Normally, one would include the initial GDP, however, it drops out of the regression in fixed effects estimations, as its value does not change over time. The baseline results are shown in the appendix with POLS estimation and initial GDP.

*Investment* is equal to gross capital formation in percentage of GDP.

Average Years of Schooling is equal to average years of education and is a proxy for human capital.

Trade is equal to trade in percentage of GDP and represents trade policies.

Government\_spending is equal to general government final consumption expenditure as a percentage of GDP and represents a country's fiscal policies.

Privatization is the dummy variable and the variable of interest. I use three types of dummies to capture the effect of privatization on economic growth. (1) Use the largest privatization per country and set the same year and the subsequent years equal to one. (2) Use the first privatization per country and set the same year and the subsequent years equal to one. (3) Include only a limited number of privatizations, primarily the ones that are above a certain threshold. This is set arbitrarily and is explained in section 5.3 below in the text. I use the following thresholds, 5%, 1%, 0.5%, and 0.1% of GDP in the same year.

$\alpha_i$  denotes a full set of country fixed effects.

$\eta_t$  denotes a full set of year effects.

$v_{i,t}$  is equal to the error term.

Table 5 below shows both the unconditional and conditional effect of privatization on GDP per capita Growth using POLS. The unconditional effect is 0.452 percent but is insignificant. When controlling for global shocks via year fixed effects in column (2), we see that the effect decreases and still is insignificant. Column (3) controls for country fixed effects, isolating the country-specific effect of privatization. Now, privatization has a larger effect (0.61 percent) on GDP growth and it is now significant. This supports existing literature that the results are primarily driven by cross-country variation. Column (4) includes both country fixed effects and time dummies. The coefficient of privatization has decreased to 0.29 percent and is insignificant, suggesting that

there are many year-specific shocks per country that must be taken into account. This is intuitive as the majority of the countries, which privatized are developing countries. The GDP of developing countries is more volatile and one reason might be that they experience more often and more severe aggregate shocks (Koren and Tenreyro, 2007). These shocks generally have a negative impact as the majority of the time dummies enter the regression with a negative sign, suggesting that growth rates were greater in the period after World War II compared to more recently. This is also not surprising as the dataset contains developed countries, many of which prospered after WW2, rebuilding infrastructure, whereas today, business cycles are smoothed and many countries aim at keeping growth positive but low at a level around 2-3 percent. Since the beginning of this dataset, 1960, we have also seen various global shocks, adding pressure to growth rates, such as the 1970's oil crisis, the dot-com bubble in the early millennium, and more recently, The Great Recession.

The same table shows the baseline model in column (5). The effect of privatization is approximately 0.26 percent and is still insignificant. The reason might be due to the inconsistency of this model or the fact that privatization actually has a zero effect on GDP growth. I use the second lag of the natural logarithm of GDP to account for the growth rate convergence instead of the initial level of GDP, which will drop out in fixed effect estimations due to its fixed value throughout all periods of observations<sup>22</sup>. We see that the coefficient on lagged GDP is positive but insignificant, unlike the prediction by Barro (1991). Investment and government spending are significant and have coefficients, positive and negative respectively, in line with earlier research. Trade and Average Years of Schooling are positive but have insignificant coefficients. Accounting for the bias caused by unobserved country differences, column (6) shows that the coefficient of privatization has increased from approximately 0.19 to 0.39 percent. It appears that accounting for the bias that POLS estimation causes, improves the relationship between the second lagged value of growth in natural logarithm and the GDP growth rate in line with the results of Barro (1991).

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<sup>22</sup> The appendix shows the results of the pooled OLS regression with initial level of GDP. The level of initial GDP also yields a negative and significant coefficient. The signs on the other control variables stay the same; however, magnitude, significance levels, and goodness of fit change due to biasedness in the POLS estimation. (See footnote 21)

Table 5 – Baseline Results

	(1) POLS	(2) Year FE	(3) Country FE	(4) Country & Year FE	(5) Baseline - POLS	(6) Baseline - FE	(7) Baseline - Life	(8) Baseline - Full
Privatization	0.452 (0.313)	0.119 (0.367)	0.613** (0.306)	0.294 (0.426)	0.259 (0.356)	0.388 (0.408)	0.351 (0.430)	0.297 (0.402)
Ln(GDP) <sub>t-2</sub>					0.00774 (0.0591)	-4.288*** (0.705)	-4.103*** (0.740)	-4.356*** (0.691)
Investment					0.155*** (0.0218)	0.189*** (0.0262)	0.178*** (0.0262)	0.193*** (0.0261)
Government Spending					-0.0976*** (0.0218)	-0.141*** (0.0434)	-0.141*** (0.0452)	-0.143*** (0.0438)
Average Years of Schooling					0.0669 (0.0446)	0.396** (0.169)		0.320* (0.173)
Trade					0.00323* (0.00185)	0.00671 (0.00557)	0.00809 (0.00574)	0.00665 (0.00556)
Life Expectancy							0.0441 (0.0363)	
Population Growth								-0.445** (0.219)
Constant	1.850*** (0.133)	1.888*** (0.125)	1.831*** (0.0358)	3.046*** (0.528)	-0.485 (1.608)	96.62*** (16.01)	91.50*** (16.79)	99.37*** (15.69)
Observations	6,313	6,313	6,313	6,313	5,666	5,666	5,564	5,661
Countries	142	142	142	142	142	142	142	142
R-squared	0.001	0.061	0.068	0.128	0.140	0.242	0.242	0.245
Adj. R-Squared		0.053	0.047	0.100		0.214	0.214	0.218
Country FE	No	No	Yes	Yes	No	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	Yes	Yes	Yes	Yes

Notes: Columns 1-4 reports the unconditional effect of privatization on the logarithmic GDP per capita Growth, and the baseline static model is presented in columns 5-8. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.



The coefficient is negative and highly significant. Investment and government spending have the same signs as before but are greater in magnitude. Average Year of Schooling is now significant at the 5% confidence level, while the coefficient of trade does not change. As a robustness check for whether the use of average years of schooling is accurate as a proxy for human capital, I estimate the same model but with the use of Life Expectancy. This is because it has been shown that life expectancy is longer in rich countries (Mathers, Sadana, Salomon, Murray, and Lopez, 2001). People are likely to live longer as many change from painful and physical jobs to jobs that benefit from advances in technology and are service-oriented. Life expectancy is also positive and does not change the signs of the other independent variables; however, it is also insignificant. It appears that schooling data is a better proxy for human capital but the model might also be sensitive to changes in regression estimations. Researchers often use different variables when analyzing different effects on GDP growth, and because of that, I include population growth in column (8). This is because it is one of four variables that are most often used in growth models according to Levine and Renelt (1992)<sup>23</sup>. This does not change the results from before. Population growth enters the model with a negative coefficient as expected, though it is insignificant.

## 5.2 Dynamic Panel Model

In next table, I estimate dynamic growth models, controlling for growth persistence. Under the presumption that GDP growth in one period partially depends on GDP growth in prior periods, I allow for lagged values of the dependent variable (Carkovic and Levine, 2002). This is often used as a robust strategy to model the data generating process and eliminate the autocorrelation in the residuals (Wilkins, 2014). Even though fixed effects yields inefficient estimates that are biased, this bias goes towards zero as the time horizon increases (Nickell, 1981). This leads me to use a similar autoregressive distributed lag model as that of Papaioannou and Siourounis (2008) and Bond, Leblebicioglu, and Schiantarelli (2004).

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<sup>23</sup> The other three variables are investment share of GDP, human capital, and a measure of initial income.

$$g_{i,t} = \delta \text{Privatization}_{i,t} + \sum_{j=1}^p \beta_j g_{i,t-j} + \pi y_{i,t-2} + \Omega X'_{i,t} + \Gamma(L) X'_{i,t} + \zeta(L) \Delta X'_{i,t} + \alpha_i + \eta_t + v_{i,t} \quad \text{Equation 6}$$

This regression is more robust to specification changes and includes three lags of annual per capita GDP growth<sup>24</sup>,  $g_{i,t-j}$ , the second lag of the natural logarithm,  $y_{i,t-2}$ , of GDP, the second lag of all control variables,  $\Gamma(L)X'_{i,t}$ , lagged difference for each control variable,  $C(L) \Delta X'_{i,t}$ , and all  $X'_{i,t}$ , which represents all control variables. The other variables are the same as those above. This dynamic fixed effect estimation uses an approach to include all potential effects and feedback as well as ensuring that the omitted variable bias reduces to a minimum. All countries with fewer growth observations than 20 periods drop out of the sample<sup>25</sup>, thereby further reducing the Nickell bias.

Column (1) shows the dynamic baseline model. Privatization is again positive, yet insignificant as before. Using a lagged value of the income level yields a negative and significant coefficient, confirming the result above. Both investment and trade exert significant and positive effects on growth while government spending is significant and negative. All of them are in line with previous research (Barro, 2003; Harrison, 1996). The proxy for human capital, average years of schooling, is negative but insignificant. Barro and Lee (2015) suggest as a potential reason that increasing educational attainment decreased per-worker GDP growth initially before a subsequent increase. They estimate the breakpoint to be at 8 years. This coefficient is the opposite of the static regression in table 5, indicating that the model might be sensitive to regression specification. Thus, I use life expectancy instead in column (2). Life expectancy has a positive and significant coefficient, yielding support that in a dynamic panel model it is a better proxy for human

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<sup>24</sup> A table in the appendix shows that values of GDP growth up until the third lag is optimal. Including more lags, does not improve the model.

<sup>25</sup> Sample reduces to 83 countries.

capital. Column (3) shows the full model including population growth. Controlling for all variables means that privatization has an even smaller direct effect. Population growth is negative but insignificant, partly in line with earlier research<sup>26</sup>.

*Table 6 – Dynamic Baseline Results*

	(1) Dynamic Baseline	(2) Dynamic Life	(3) Dynamic Full
Privatization	0.397 (0.324)	0.356 (0.344)	0.197 (0.335)
Ln(GDP) <sub>t-2</sub>	-3.186*** (0.588)	-3.042*** (0.617)	-3.141*** (0.600)
Investment	0.115*** (0.0287)	0.106*** (0.0298)	0.113*** (0.0292)
Average Years of Schooling	-0.983 (1.600)		
Government Spending	-0.147*** (0.0483)	-0.164 (0.120)	-0.157 (0.119)
Trade	0.0356*** (0.0100)	0.0373*** (0.01000)	0.0361*** (0.0101)
Life Expectancy		0.0261 (0.183)	0.546** (0.234)
Population Growth			-0.0630 (0.320)
Constant	76.01*** (14.03)	69.40*** (14.51)	71.25*** (14.20)
Observations	5,239	5,145	5,134
Countries	130	130	130
R-squared	0.301	0.303	0.310
Adj. R-squared	0.274	0.276	0.282
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Notes: This table reports the dynamic panel regressions. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

<sup>26</sup> The second lag of population growth is negative and significant though.

### 5.3 Robustness Check for the Privatization Variable

Actual privatization may not satisfy the above assumption that a country is “privatized” when it has a record of the largest privatization in the Privatization Database. The reason for this is that the largest privatization in a country will likely be one after a series of privatizations, The odds of a successful privatization increases every time a new company is privatized. Because of the uncertainty regarding the outcome of a privatization, States were initially reluctant to large-scale privatization and thus pursued privatizations cautiously. As time went on, privatizations became more popular, in particular after the experiences in the United Kingdom, and the total volume of privatizations increased steadily until the dot-com bubble (Megginson, 2005). In addition, the number of potential buyers is likely also to have increased over time, further fueling the price of privatizations. The first privatization, however, is a symbol of the change of direction that the country is taking, politically. In 1990s, many of the firms divested were Small- and Medium-sized Enterprises (SMEs) (C. V Chang, 2006; Harsch, 2000; Megginson, 2005). For example, privatizations in Mozambique had an average value of US\$300,000 (Harsch, 2000). In addition, a privatization in the database is subject to measurement error and thus it may not adequately representing the largest privatization in a country. The new construction is therefore more likely to provide support for the use of privatization as a dummy, leading to the following assumption:

*Assumption privatization dummy variable no. 2: A country is “privatized once”, equal to the same year it earns the first revenue of the sale of a State-Owned Enterprise.*

The assumption above appears to take the measurement errors into account compared to the first assumption. However, it may not be enough for the assumption to hold. Despite the fact that only privatizations worth more than US\$1 million are included in the Privatization Database, they might be small and have limited effect on the economy. Thus, this dummy variable may report a privatization that does not have an effect on a larger scale, causing the assumption to be violated. Privatization is not easily converted into a dummy variable and one must be cautious as to use the privatization of a company in the same way as studies estimating the effect of democracy on economic growth. In the case that countries initially privatize small companies, the action might not symbol an ideological change towards new aspirations of growth and it represent a privatization

large enough to stimulate the economy. Some countries have adopted an approach called step-by-step or learning-by-doing where privatizations were carried out slowly such as the United Kingdom, whereas other countries privatized some of the largest SOEs, demonstrating their commitment to privatizations (Lin and Chen, 1996). In many Eastern European countries and the former Soviet Union, massive and unplanned privatizations created other economic problems. Thus, to make sure that I only include firms that almost surely have had an effect on GDP growth, I follow the approach of Plane (1997) with the use of a threshold of GDP for estimating the effect of privatization on growth. Unlike Plane, who uses a threshold of cumulative privatization proceeds relative to 1990 Gross Domestic Product, I use a threshold of privatization proceeds from the largest privatization per country relative to GDP in the same year as the privatization, upholding the fact that some of the largest privatizations have a direct or indirect effect on economic growth. In addition, Bolton and Roland (1992) report that large enterprises are more difficult to privatize. This leads me to the following assumption:

*Assumption privatization dummy variable no. 3: A country is “privatized once”, equal to the same year it earns the largest revenue of the sale of a State-Owned Enterprise, given that the volume of the revenue is greater than a minimum threshold.*

I use the following threshold for the dummy variable no. 3:

$$\text{Privatization dummy no. 3 (1)} = \begin{cases} 1, & \text{if } \frac{\text{Volume of privatization proceeds}_t}{\text{GDP}_t} \geq 5\% \\ 0, & \text{otherwise} \end{cases}$$

*Equation 7*

This variable is possibly more accurate than the earlier two, because it only takes privatizations with a sales volume more or equal to 5% of GDP in the same year (13 countries). Because of this threshold, a privatization is almost certain to have an effect on the economy as it increases the government’s budget considerably, allowing them to use the proceeds on policies aimed at stimulating economic growth. Smaller privatizations, however, are also likely to affect economic growth, even though they are not as large relative to GDP because of the inflation in privatization

proceeds over time, both individually and collectively. I will therefore also use the following thresholds relative to GDP:

*Threshold for privatization dummy variable no. 3(2) = 1% of GDP (52 countries),*

*Threshold for privatization dummy variable no. 3 (3) =0.5% of GDP (70 countries), and*

*Threshold for privatization dummy variable no. 3 (4) = 0.1% of GDP (88 countries).*

Using different thresholds allows for dummy comparisons, enlightening which is the most accurate variable, in line with history and previous research, to use in the rest of the analysis. Table 7 below shows the full model with the different dummy variables. All dummies provide support for hypothesis 1 above, except for dummy number 1. We can see that only dummy no. 2 and dummy no. 3 with 5% threshold are significant at the 1% and 5% significance level, respectively. However, the latter has a coefficient that is 1 percent higher (2.047 % vs. 0.953 %) than the former, suggesting that larger privatizations have a greater effect on economic growth than early privatizations. The adjusted R-squared is nearly the same for all models, with dummy no.2 having the highest and the original dummy having the lowest (0.284 vs. 0.282). This is not surprising as all models only differ by the privatization dummy variable. The fact that the privatization variable is a dummy means that the changes from one dummy to the next is downscaled because the change is mainly related to when the dummy takes the first value of one. All control variables are similarly across all models with small changes in the coefficient but with constant signs. It is intuitive to draw the conclusion that the first privatizations across countries symbolizes a change in policy aimed at improving the economy and subsequently increase growth in the years after. In addition, the larger volume a privatization has, the larger is its effect on economic growth. The study of Barnett (2000) indicates privatizations worth more than 1 percent of GDP would be associated to a 0.5 percent increase in the real growth rate, likely due to the fact that private firms outperform SOEs (see Megginson (2005) for a review of earlier research). Based on the above, dummy no. 2 appears to capture the effect of privatization that this research aims to analyze and will thus be used throughout the rest of the analysis.

Table 7 – Full Dynamic Model with Difference Dummy Variables

	(1)	(2)	(3)	(4)	(5)	(6)
	Dynamic – Full	Dynamic – Full	Dynamic – Full	Dynamic – Full	Dynamic – Full	Dynamic – Full
Privatization 1	0.197 (0.335)					
Privatization 2		0.953*** (0.312)				
Privatization 3 (1)			2.047** (0.972)			
Privatization 3 (2)				0.814** (0.405)		
Privatization 3 (3)					0.769** (0.358)	
Privatization 3 (4)						0.585* (0.350)
Constant	71.25*** (14.20)	71.79*** (14.28)	70.82*** (14.16)	69.74*** (14.27)	71.49*** (14.27)	71.76*** (14.40)
Observations	5,134	5,134	5,134	5,134	5,134	5,134
Countries	130	130	130	130	130	130
R-squared	0.310	0.312	0.311	0.311	0.311	0.310
Adj. R-squared	0.282	0.284	0.284	0.283	0.283	0.283
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression and differ only w.r.t. the variable of interest, privatization dummy. Coefficients on lagged, lagged differenced and differenced variables are not reported. Coefficients on control variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

I will compare the results with those of that with dummy no. 3 (1) investigating the dynamics of privatizations in terms of size<sup>27</sup>.

#### 5.4 The Effect of Privatizations Across Regions, Income, and Industries

This section will look at privatization across the following regions: Africa, Asia, Latin America and the Caribbean, Oceania, and More Developed Regions. Secondly, it will look at the main income groups: high-, middle-, and low-income countries. Finally, it will look at the following industries: Competitive, Energy, Financial, Infrastructure, Manufacturing & Services, Other, Primary, and Services, and Telecommunications, and analyze how privatizations differ accordingly. I adjust the dynamic panel model from above to estimate the effect of privatization in a subsample, depending on the region, income group or industry. The motivation for dividing the sample this way is that there is a large division between a developed and a developing country and that the effect found earlier might not represent the effect in developing countries. This means that I estimate the dynamic panel regression from equation 7 with a small adjustment to the sample size.

Table 8 shows the effect of privatization on economic growth within a region. The reasoning behind this is that neighboring countries are similar in terms of culture, development, and legislature. The European Union is an example of this, and by looking at the effect in different regions, we can get an indication of which situations privatization works better. Column (1) shows that privatization has a statistically effect of zero in Africa, however, the sign is negative and suggests that if any effect, it is negative. This is in sharp contrast to the effect in all other regions, which is positive. Interestingly, the coefficient both increases and becomes significant at the 1% significance level when estimating a regression in developing countries excluding the African region, which can be seen in table 9 below. This suggests that privatization in Africa has a smaller effect than in other developing countries. Columns (2) and (3) show that privatization in Asia and Latin America and the Caribbean, respectively, has a positive effect, but both coefficients are insignifi-

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<sup>27</sup> These tables will primarily be reported in the appendix.



cant. The effect is large and significant in Oceania in column (4); however, this subsample consists of only three countries. Interestingly, privatization has a coefficient of above 3 percent and is significant for countries categorized as part of the More Developed Regions in column (5). The goodness of fit is also the largest for this regression with an adjusted value of 64 percent.

Table 8 – Privatization Across Regions

	(1) Africa	(2) Asia	(3) Latin America and the Caribbean	(4) Oceania	(5) More devel- oped re- gions
Privatization 2	-0.466 (0.644)	0.961 (0.672)	0.164 (0.713)	4.773 (1.832)	3.073*** (1.071)
L2.lngdp	- 3.183*** (0.850)	- 4.117*** (1.479)	-3.472*** (0.841)	-22.98** (2.982)	-5.393*** (1.363)
Investment	0.140*** (0.0357)	0.125 (0.100)	0.0851 (0.0607)	0.132* (0.0374)	0.0983** (0.0470)
Life Expectancy	-0.865 (1.272)	-0.613 (0.650)	-4.897 (3.574)	4.611 (30.01)	0.211 (0.235)
Government Spending	-0.0324 (0.116)	-0.128 (0.138)	-0.123* (0.0703)	0.0934 (0.298)	-0.791*** (0.208)
Trade	- 0.0905** (0.0440)	0.0329* (0.0189)	-0.0146 (0.0291)	-0.0376 (0.0846)	0.0743*** (0.0205)
Population Growth	0.000386 (0.947)	-0.329 (0.358)	-1.655 (2.285)	-5.489 (2.594)	-0.0450 (0.609)
Constant	67.31*** (19.91)	114.1*** (35.92)	80.24*** (20.04)	499.6** (68.95)	137.0*** (32.35)
Observations	1,527	1,187	1,047	114	1,259
Countries	36	34	23	3	34
R-squared	0.238	0.417	0.428	0.660	0.669
Adj. R-squared	0.182	0.363	0.374	0.108	0.640
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in regional subsamples. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  indicate levels of significance. Country and year fixed effects are not reported.

The story of these results is possibly that privatizations in many developed countries occurred before data was collected for the Privatization Database and the countries in this region, which do have privatizations, after the beginning of the recording period, take advantage of these earlier experiences<sup>28</sup>. The British government, a privatization pioneer, had only little relevant experience to draw on when it privatized firms in the 1980s and relied greatly upon the regulation by industry regulators and competition authorities to set clear objectives, securing successful privatizations (Robinson, 2003). In addition, countries in the More Developed Regions have characteristics that are more alike compared to other developed countries than those of developing countries. Asian countries are less developed than the above-mentioned group, and have a similar level of development as the countries in Latin America. There are poor countries like Bangladesh, parts of India and China, and richer ones like the Special Administrative Region of Hong Kong and South Korea. Privatization has a greater effect in both of these regional groups than countries in Africa. This can be due to many reasons, e.g. corruption, however, there appears to be a pattern here. The appendix shows the same estimations, except with only the largest privatizations. This table shows that developed countries experience successful privatizations at a statistical level (there is no privatizations in Oceania), but the sign of the coefficient is also positive in Africa and Asia. The effect is negative in Latin America and the Caribbean. A potential reason for this could be the intensive nationalization programs pursued by countries in this region, such as Chile and consequently the privatization programs, once the nationalization programs failed. This is also why privatization in Latin America is popularly perceived as a failure, despite many studies showing the opposite (Megginson, 2005; Yotopoulos, 1989). Privatization appears to have a greater effect in countries, which have a certain level of development or income, providing support for hypothesis 2. Running the regression on developing countries in table 9, as categorized

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<sup>28</sup> See Chang (2006) for a possible explanation why privatization was highly successful in developed countries and why the effect was not the same in developing countries.

by the United Nations (Department of Economic and Social Affairs, 2010), shows that privatization across developing countries has a positive effect in with a coefficient of 0.485 percent; however, it is smaller in magnitude than in the whole sample and may even be zero as it is statistically insignificant. Again, here we can see in column (2) that the largest privatizations have a greater effect than the first recorded privatization in column (1). Column (3) excludes Africa based on the results above, indicating that if an effect in the region may be negative. The coefficient increases more than twofold to 1.21% and is statistical significant at the 99% confidence level. Almost the opposite happens in column (4), where the effect is smaller and still insignificant for the largest privatizations. The cause of these changes may be due to that African countries privatized State-Owned Enterprises later than the other countries and were quicker to privatize larger firms, likely by pressure from the IMF, World Bank, and other creditors. Another thing that happened around the same time in Africa was resistance towards privatizations in addition to political instability across the region. Privatization was in some cases one of the reasons for ousting the government through an election or a military coup (Harsch, 2000). This is also why Harsch (2000) wrote in an article that: “Privatization in Africa remains highly controversial and politically risky” (p. 8). He notes in the same article that even some high-level government officials have been resistant towards privatization with Gabonese Interior Minister Louis Gaston Maquila denouncing it a form of “economic recolonization” (p. 9).

*Table 9 - Developing Countries*

	(1) Dummy 2	(2) Dummy 3 (1)	(3) Dummy 2 excl. Africa	(4) Dummy 3 (1) excl. Africa
Privatization 2	0.485 (0.399)		1.209*** (0.441)	
L2.lngdp	-3.686*** (0.936)	-3.657*** (0.929)	-3.606*** (1.130)	-3.507*** (1.149)
Investment	0.145*** (0.0358)	0.147*** (0.0361)	0.158** (0.0747)	0.158** (0.0751)
Life Expectancy	-0.372 (0.662)	-0.319 (0.654)	-0.274 (0.785)	-0.347 (0.772)
Government Spending	-0.110 (0.122)	-0.108 (0.122)	-0.0851 (0.0992)	-0.0747 (0.102)

Trade	0.0385*** (0.0130)	0.0368*** (0.0127)	0.0500*** (0.0169)	0.0475*** (0.0164)
Population Growth	0.729** (0.318)	0.709** (0.314)	0.761* (0.391)	0.704* (0.392)
Privatization 3 (1)		1.838 (1.112)		1.175 (1.176)
Constant	82.28*** (21.96)	81.33*** (21.88)	83.80*** (25.12)	80.80*** (25.69)
Observations	3,344	3,344	1,867	1,867
Countries	85	85	55	55
R-squared	0.287	0.288	0.409	0.407
Adj. R-squared	0.253	0.254	0.389	0.367
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in a subsample, consisting of developing countries as identified by the United Nations only. Columns (2) and (4) exclude African countries. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

To see if there privatization actually differ across income groups, I divide the sample up in to three income groups and also include a regression, consisting of sample of only developing countries (the same as column (1) in table 9). The results are shown in table 10.

*Table 10 - Income Groups*

	(1) Developing Countries	(2) Low In- come	(3) Middle In- come	(4) High In- come
Privatization 2	0.485 (0.399)	-1.809 (1.259)	0.920** (0.369)	0.216 (0.613)
L2.lngdp	-3.686*** (0.936)	-4.726*** (1.104)	-3.317*** (0.933)	-2.282*** (0.707)
Investment	0.145*** (0.0358)	0.151** (0.0581)	0.144*** (0.0415)	-0.00682 (0.0352)
Life Expectancy	-0.372 (0.662)	-0.760 (3.194)	0.452 (0.631)	-0.0504 (0.225)
Government Spending	-0.110 (0.122)	0.126 (0.0986)	-0.167** (0.0761)	-0.479*** (0.133)
Trade	0.0385***	-0.0771	0.0430***	0.0307*

	(0.0130)	(0.0730)	(0.0146)	(0.0153)
Population Growth	0.729**	1.870	0.483	-1.063***
	(0.318)	(1.386)	(0.407)	(0.115)
Constant	82.28***	87.53***	79.11***	61.99***
	(21.96)	(24.48)	(23.02)	(16.52)
Observations	3,344	689	2,664	1,781
Countries	85	18	67	45
R-squared	0.287	0.259	0.352	0.543
Adj. R-squared	0.253	0.153	0.317	0.512
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in subsamples by income level. Column (1) is the same as column (1) in table 9. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  indicate levels of significance. Country and year fixed effects are not reported.

The table also shows that privatization is negative (insignificant) in low-income countries and positive in middle- (significant) and high-income (insignificant) countries. One reason is likely concerned with the legal framework per country. In addition, countries which Stiglitz (2003) identifies successfully transitioning after the fall of the Soviet Union – Hungary, Poland, and Slovenia – are all included in the middle-income group, and they seemed to be privatizing slowly. It may also be due that the individuals or companies that are on the buy-side of the privatization process are less skilled in developing countries compared to the developed region. This will only help explaining the difference between developed countries and the bottom part of developing countries. In addition, this table in connection with the earlier results indicate indeed that there is a threshold, after which a country is likely to experience privatizations that are more successful. We can get an idea of where this threshold may be, looking at table 11. It shows the effect of privatization in different subsamples<sup>29</sup>. All coefficients of interest are insignificant, so there is no clear results. However, by looking at the signs, we can see that privatizations have a negative effect in the subsample with the poorest countries and those affected by conflicts, such as war, and a positive effect in the other subsamples. This possibly suggests that countries, which are heavily

<sup>29</sup> These are IBRD-countries, IDA-countries, least-developed countries, fragile and conflict affected countries, and heavily indebted poor countries (World Bank, 2015a) .

indebted but not categorized as a Least Developed Country (LDC) can experience positive effects of privatizations. It is reasonable to believe that this threshold is partly due to the legal framework in a country, whose importance was emphasized by Stiglitz (2003) and Nellis (2005) who finds that privatization in African countries should be accompanied by “creation and reinforcement of the institutions that underpin and guide proper market operations” (p. 2). Otherwise, these regulatory and legal gaps must be filled externally.

*Table 11 - Other Categories*

	(1) IBRD	(2) IDA	(3) LDC	(4) Fragile	(5) HIPC
Privatization 2	0.496 (0.435)	0.989 (0.824)	-0.631 (1.247)	-1.187 (1.205)	0.198 (0.888)
L2.lngdp	-3.221*** (0.820)	-5.980*** (1.529)	-4.167*** (1.303)	-5.309*** (1.365)	-4.900*** (1.106)
Investment	0.150** (0.0678)	0.104** (0.0428)	0.0703* (0.0410)	0.279** (0.106)	0.159*** (0.0443)
Life Expectancy	-0.132 (0.559)	0.565 (1.316)	0.153 (2.266)	-8.162* (4.159)	-1.415 (2.580)
Government Spending	-0.342 (0.268)	-0.0387 (0.113)	0.0371 (0.103)	0.190 (0.140)	0.00456 (0.101)
Trade	0.0600** (0.0233)	-0.0396 (0.0394)	-0.0662 (0.0544)	-0.0860 (0.0794)	-0.0467 (0.0473)
Population Growth	-0.537 (0.690)	1.658* (0.944)	2.136* (1.087)	4.188** (1.870)	0.943 (1.236)
Constant	76.76*** (20.56)	127.3*** (34.60)	85.86*** (29.39)	104.7*** (30.21)	102.3*** (24.18)
Observations	1,947	1,305	941	510	1,154
Countries	48	34	25	14	27
R-squared	0.402	0.253	0.238	0.278	0.222
Adj. R-squared	0.364	0.189	0.154	0.139	0.153
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in subsamples by other categories. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

We have seen that there are differences to the effect of privatization on GDP growth, depending on the income level of the country that the privatization takes place in. It is also of interest to see what the differences may be according to industry. For example, companies in industries with high barriers to entry are often larger than companies in industries with low barriers to entry. Looking at privatizations across industries will help explaining whether the symbolism of the first privatization in a country is correctly assumed. The results are shown in table 12 below. All effects are positive (except for infrastructure), while the only industries that have significant coefficients are energy, manufacturing, and telecommunications. This indicates that the earliest privatizations, which were successful, were in some of the largest sectors. Column (2) shows the same estimation but with the use of dummy no. 3 (1) only, taking the relatively to GDP largest privatizations into account. This time competitive, financial, and services have significant effects. The table furthermore shows that the privatizations have a greater effect in the energy sector, if they are pursued early, while the opposite is true for the competitive, financial, infrastructure, and services sectors. One potential reason for this relationship may be that energy sectors across countries are heavily regulated, whether the companies are state-owned or privately owned, cf. the Organization of the Petroleum Exporting Countries (OPEC). A table of the effect of the remaining privatization variables (3) is presented in the appendix. It shows that the privatizations in the competitive, energy, infrastructure, and services sector have greater effect on economic growth the larger they are. Privatizations in the financial, manufacturing, and primary sector have the opposite effect, where the early privatizations seem to have a greater effect than the largest privatizations. All in all this shows that sectors with some of the largest firms especially in the developing countries, have effects which are positively correlated with the firm size.

## 5.5 Mechanisms

I explore the mechanisms in this section through which privatization might affect economic growth. The reason behind this is that economists studying growth do not know exactly what variables are part of the regressors (Sala-i-Martin, 1997), and intuitively privatization may have a greater effect on economic growth through other mechanisms compared to directly, through improving performance, proceeds from the sale directly in the budget, and reduction in subsidies. I estimate the regression below following Acemoglu et al. (2014):

$$x_{it} = c + \beta \text{Privatization}_{i,t} + \sum_{j=1}^p \pi_j y_{i,t-j} + \sum_{j=1}^p \eta_j x_{c,i-j} + \alpha_i + \eta_t + v_{i,t}$$

I present the conditional effect in the Table 13, controlling for investment, schooling, life expectancy, government spending, and trade, respectively, and seeing whether the effect of privatization goes through one of them.

*Table 12 - Industries*

	(1)	(2)
	Privatization 2	Privatization 3 (1)
Competitive	0.439	7.908***
	(1.136)	(1.410)
Energy	2.232***	0.938
	(0.678)	(2.287)
Financial	0.644	1.170*
	(0.406)	(0.672)
Infrastructure	-0.186	0.343
	(0.474)	(0.796)
Manufacturing	1.160*	0
	(0.678)	(0)
Other	0.189	0
	(0.380)	(0)
Primary	0	0.652
	(0)	(0.501)
Services	0.495	12.39***
	(1.153)	(1.123)
Telecommunications	1.236***	0
	(0.385)	(0)
Constant	81.08***	71.11***
	(19.12)	(18.45)
Observations	3,408	3,408



Countries	130	130
R-squared	0.306	0.311
Adj. R-squared	0.270	0.277
Country FE	Yes	Yes
Year FE	Yes	Yes

Notes: This table reports the full dynamic panel regression with privatization divided into industries. All industries categories represent the effect of privatization, if it were to happen only in that category. Coefficients on lagged, lagged differenced and differenced variables and coefficients on control variables are not reported. Robust standard errors are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  indicate levels of significance. Country and year fixed effects are not reported.

Per regression, one of the control variables is equal to the dependent variable,  $x_{it}$ , and  $\sum_{j=1}^p \eta_j x_{c,i-j}$  is equal to its lagged values up to the order three.  $\sum_{j=1}^p \pi_j y_{i,t-j}$  is equal to GDP per capita Growth, also up to lagged value of the order three.  $\alpha_i + \eta_t + v_{i,t}$  are equal to country fixed effects, year fixed effects, and error term, respectively. Privatization has a positive effect on all channels, except for trade. This is surprising as one might think that the government uses some of the proceeds to increase trade, as it will stimulate the economy but the effect is statistically insignificant. The same is true for average years of schooling and government consumption. Intuitively, a government increases its spending following a sale of a SOE because of the extra amount of funding available. However, Barnett (2000) concludes that governments tend not to increase expenditure following a privatization by showing that the deficit does not increase. Privatization has a significantly, positive effect on investment and life expectancy, suggesting that the proceeds are not merely saved. Governments likely use part of the proceeds to increase public investments. The reason why life expectancy increases following a privatization is a puzzle. It could be one of many things, though I believe this is due to a spurious relationship caused by a rise in life expectancy in both low-, middle-, and high-income countries (Riley, 2001) due to many factors and the construction of the dummy that takes the value of one in the year of a privatization and the years thereafter. Overall, these results suggest that privatization also has an indirect effect on economic growth through various channels. I cannot say that these are the only channels it works through, however, I have established the fact there is a relationship, providing support for hypothesis 3.

Table 13 - Mechanisms and the IMF

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Investment	Schooling	Life Expectancy	Government Spending	Trade	IMF - all	IMF - Developing
Use of IMF Credit						-3.87e-11 (4.57e-11)	-1.99e-11 (4.53e-11)
L2.lngdp						-4.375*** (0.954)	-4.658*** (1.070)
Investment						0.126*** (0.0297)	0.135*** (0.0301)
Life Expectancy						-0.349 (0.645)	0.535 (0.632)
Government Spending						-0.124 (0.122)	-0.124 (0.125)
Trade						0.0373*** (0.0124)	0.0346*** (0.0126)
Population Growth						0.713** (0.284)	0.737** (0.285)
Privatization 2	0.521** (0.230)	0.000753 (0.00246)	0.0430*** (0.0130)	0.0191 (0.140)	-0.502 (0.565)		
Constant	4.157*** (0.741)	0.0838*** (0.0103)	1.382*** (0.196)	2.552*** (0.480)	6.166*** (1.722)	93.56*** (20.82)	104.4*** (25.27)
Observations	5,271	5,742	5,608	5,407	5,471	3,122	3,015
Countries	130	130	130	130	130	89	
R-squared	0.785	1.000	1.000	0.867	0.975	0.327	0.321
Adj. R-squared	0.778	1.000	1.000	0.867	0.974	0.293	0.286
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1)-(5) reports the effect of privatization on investment, schooling, life expectancy, government spending, and trade, respectively. Columns (6) and (7) reports the full dynamic panel regression with Use of IMF Credit as the variable of interest on the full sample and a subsample, consisting of developing countries, respectively. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## 5.6 Using IMF Loans as a Proxy for Privatization

As explained in the methodology chapter, I use a different approach to measure the impact of privatization on economic growth, namely IMF loans. IMF has used privatizations as one of its conditions on loans, and using this measure allows us to take the scale of privatizations into account, as recognized by Cook and Uchida (2003) who argue that the use of a dummy variable for privatization does not convey information on the magnitude of privatization. This means that privatization is not assumed to have the same effect as before. This will perhaps shed new light on the relationship between IMF borrowings and economic growth and its relation to privatization.

I use the variable Use of IMF credit as a proxy for the volume of privatization. This proxy is valid as Brune et al. (2004) find that countries, which borrowed from the IMF increased sales volume of privatizations subsequently. For the actual effect, they estimate that: “for every dollar a country owed the IMF, it subsequently privatized assets worth approximately 50 cents” (p. 197). The motivation for this estimation is that it will add perspective to the discussion of the concept of the inclusion of privatizations as a condition on the loans of IMF. Assuming that a country, which borrows from the IMF privatizes on a greater scale, we should see a positive relationship between IMF loans and economic growth, leading to the following hypothesis:

*Hypothesis 4: Use of IMF Credit has a positive effect on GDP per capita Growth.*

Column (6) and (7) in table 13 above report the full model with Use of IMF Credit as the variable of interest. Because the interest here is on developing countries and not on industrialized countries, the sample is narrowed into consisting of developing countries only in column (7). There is no significant relationship in both estimations; however, the negative sign of the coefficient of Use of IMF Credit suggests that if there were, it would be negative, in contrast to hypothesis 4. This is not conclusive in any way and further research is needed in this area. One must also think about the reverse causation and the role GDP plays concerning IMF loans. The negative sign and insignificance may further suggest that the assumption between privatization and Use of IMF Credit is not as straightforward as assumed above, likely due to the fact that Use of IMF Credit

includes loans from the IMF, which do not come with conditions and hereby privatization conditions. It might be negative due to other reasons. One of them is that some politicians use IMF loans for discretionary reasons (A. K. Dixit, 1996; Vreeland, 2003). If the government wish to implement one of more reforms that the opposition might block, it can enter into an agreement with the IMF and let the IMF with its conditions publicly take the blame for the reforms. Smith and Vreeland (2003) suggest that these type of loans are an indication of a leader being in trouble already and that the loans are likely to be followed by deposition, if the government expects bad economic performance after the IMF loan. In addition, dictatorships are more likely to receive IMF loans as they make easier negotiation partners, as they are not constrained by the public opinion and competitive elections (Przeworski and Vreeland, 2000). The reason for this is that dictatorships are more likely to accept the policies that the IMF prefers. Easier negotiation partners can also be interpreted as weaker negotiation partners from the point of view of the IMF, as dictatorships are more likely to sign the IMF's preferred policies, even though some of which can be debatable, while democratic elected governments know they will have to answer to the public. They are thus more reluctant to accept all conditions attached to the loans from the IMF.

## 6 Limitations

This section will outline some limitations affecting this study. One limitation is that this study only considers privatizations, which take place between 1988 and 2008. This automatically rules out privatizations before 1988 and after 2008. Privatization dummy no. 2 is affected by not having records of earlier privatizations. Some countries privatized before this period. I expect that this will slightly change the results because privatizations happened earlier in some countries; many of these in developed countries and some privatizations were reversed<sup>30</sup>, e.g. Chile and France. In view of that, privatization accelerated, both in terms of numbers and volume in the 1990s (C. V Chang, 2006; Cook and Uchida, 2003; Harsch, 2000; Megginson, 2005) and therefore the dummy no. 2 from the current dataset may accurately symbolize a change in policy. It is not out of the ordinary that aggregate data may suffer from measurement error, especially in developing countries, however, to limit this error, I use data from the World Bank like many others

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<sup>30</sup> I have no data on whether the privatizations were reversed, but this is not relevant for this study.

performing research in this area and at the same time use the largest dataset possible. In addition, I do not take whether a privatization has been reversed into account.

Another limitation is that there are years of booms and recessions that may affect the results. One method to deal with this is to use 5-year averages. This will also reduce the bias that is likely to occur from a change in policy, if the assumption for privatization dummy no. 2 is valid. Privatization is likely to be a result of a change in policy, whether it comes from the government itself or from outside pressure. Nevertheless, Krause and Kihwan (1991) argue that changes in policy “come as a result of a crisis” (p. 2) and this indicates that the first privatization (dummy variable no. 2) comes at a time where the economy is not doing well, and thereby likely have an instant positive effect. In line with this, one must also consider if prior values of GDP growth affect the decision to pursue privatization and that the decision to privatize therefore is endogenous. This may be case, given that sometime privatizations are used to stimulate the economy when it is performing suboptimally. This may come straight from the government itself, however, in some cases, a country finds itself in a position in which it decides to borrow from the IMF and thereby adhere to the conditions attached to the loans. This fact adds support for a positive relationship between privatizations and IMF loans. However, at the same time, it shields the temporary (growth) and permanent effect (level) and reports only one overall effect.

We cannot say that privatization has a causal effect on economic growth. However, all types of privatization dummies in table 14 suggest that there is direct, positive relationship between privatization and growth when accounting for both country and year fixed effects. Intuitively though, privatization is likely to affect GDP per capita Growth through various channels. For example, a government uses its revenues from a privatization sale either on saving by reducing the budget deficit or increases government spending and investment. Further research is needed to say whether privatization has a causal impact on economic growth and in that case, what the effect is. The assumptions above needed to construct the dummies may be violated, leading the research design to be flawed. It is uncertain to assume that the privatization observed is truly synonymous with a change in policy in favor of privatizations. In addition, there are changes on the firm side after a privatization as prior research has shown, which happen as the newly-privatized

firm goes through a beginning with new owners, with different visions regarding firm performance and ideas of how to make those visions come true. Firms often change the number of employees as part of a restructuring process, increase debt level and investment, and pay more taxes if profits rise. In some way, it is arguable that the dummy variable for privatization captures this effect. By only taking the value of zero or unity, it may arguably absorb the effects that happen further down the line by a multiplying effect. Various robustness checks for the dummy variable account for this; however, given the limitation of data availability, these have been conducted with the same data. We must look at the magnitude of the effects of the privatization variable with cautious eyes, as countries in most cases have more than one privatization over time. This also means that the privatization variable is most likely to be accurate as an event that symbolizes a change of policy. In light of the analysis suggesting that dummy no. 2 is the best proxy for privatization out of all the privatization variables when using a dummy variable approach, further research is encouraged. This includes constructing the dummy variable based on the first privatization per country, found via other sources and thereby taking earlier privatizations than 1988 into account. In addition, it is encouraged to perform a difference-in-difference analysis among the countries, by either the current specification or another.

Table 14 - Unconditional Fixed Effects

	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects	(6) Fixed Effects
Privatization 1	0.294 (0.426)					
Privatization 2		1.466*** (0.406)				
Privatization 3 (1)			2.978** (1.296)			
Privatization 3 (2)				1.510*** (0.495)		
Privatization 3 (3)					1.305*** (0.459)	
Privatization 3 (4)						1.087** (0.471)
Constant	3.046*** (0.528)	3.042*** (0.524)	3.004*** (0.532)	3.014*** (0.530)	3.025*** (0.527)	3.030*** (0.526)
Observations	6,313	6,313	6,313	6,313	6,313	6,313
Countries	130	130	130	130	130	130
R-squared	0.128	0.133	0.132	0.131	0.131	0.130
Adj. R-squared	0.101	0.105	0.104	0.104	0.103	0.103
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## 7 Conclusions and Policy Implications

The objective of this thesis was to investigate the relationship between privatization and economic growth. This is not the first study in this area, but research design differs from study to study. This is especially true for research that have specifically looked at the same relationship as the author. However, this study uses a different approach while finding a threshold when a privatization is successful and when it is not and finding an area in which this threshold lies in. There is more consensus of how to estimate the effect of privatization when looking at firm performance compared to looking at economic growth. This study therefore takes inspiration from research in another area of growth, namely democracy (Acemoglu et al., 2014; Papaioannou and Siourounis, 2008). One reason for this is that these studies with democracy also use a binary variable as the variable of interest. At the same time, they also deal with the biases that a panel dataset like mine contains in different ways.

The empirical findings in this research show that all the privatization methods have positive effects on economic growth (albeit some insignificant) and at the same time, that the early privatizations have had a more significant effect than the largest privatizations across all countries. This is likely due to privatization being used as a tool after series of nationalization programs in politics to stimulate growth. The total sales volume of annual privatizations increased around the world after the Thatcher-led government in the 1980s in United Kingdom pioneered some successful privatizations. The largest privatizations surrogates this influence or trend, as the magnitude of their effect is larger than early privatizations. The results further suggest that middle-income countries across the world have directly benefitted positively from privatization, but also indirectly through other channels. This is also true for countries in more developed regions that are likely to take experiences from countries alike into account before privatizing themselves. It appears as though that there is a threshold for when a privatization has a positive effect on GDP per capita Growth and that this threshold lies in the region beneath countries, richer than LDCs but still be heavily indebted. LDCs and countries, which are fragile or suffer from conflict, are likely to experience a negative effect of privatization.



The implications for policies involving privatizations from this study concern those of the largest privatizations and those of the first privatizations in a country. It appears as though that privatization overall has a positive effect on economic growth, this cannot be interpreted as privatization always being a feasible option to pursue as part of an economic toolbox to stimulate the economy. In the light of the results above, the newly proposed privatizations in Greece are likely to succeed, given the country characteristics and level of development, and if the economic environment in Greece has not severely changed after the Great Recession and the following debt crisis in the country. Earlier research has on the one hand shown that private firms outperform public firms, while on the other hand shown no statistical significant difference. One potential reason is that privatization alone is not always successful. Privatization does not contribute to economic growth without restructuring and corporate governance (Stiglitz, 2003). Stiglitz says in the same text “how privatization is conducted (i.e., the institutional infrastructure and macroeconomic policy framework that accompanied it) is as every bit as important as privatization itself” (p. 114). For example, privatizations in the United Kingdom were assisted by regulatory and competitive adjustments. This is also the case in developing countries, which have weaker capital markets than developed countries, and the governments must play a more active role in the economy because of its social and economic obligations to protect not only employees and Small- and Medium-sized Enterprises, but also special ethnic groups (Lin and Chen, 1996). The analysis above paints a similar picture by the fact that countries in the lowest income group likely experience a negative effect of privatization, as these countries are not sufficiently developed. In sharp contrast, there is clear evidence that privatizations have been more successfully in richer countries. Governments in Latin America and the Caribbean and in Africa must be careful when pursuing privatizations. These regions have the lowest effects of privatizations on economic growth and this possibly explains why there is a greater distrust and opposition towards privatizations in these regions compared to others. If, and when they pursue further privatization, they must carefully adjust the economic environment accordingly as carried out successfully in the United Kingdom under the Thatcher years. However, privatization should probably not be the first tool for stimulating the economy in the poorest countries. A possible suggestion is that privatizations are pursued from an economic viewpoint and not from a political one, thereby increasing the

odds of a successful privatization, both in terms of firm performance and in terms of economic stimulus of the economy, and maybe change the legal framework, making sure it can accommodate the new market dynamics.

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## Appendix

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## A. List of all countries in the dataset

### **Africa:**

Algeria  
Benin  
Botswana  
Burundi  
Cameroon  
Central African Republic  
Congo, Dem. Rep.  
Congo, Rep.  
Cote d'Ivoire  
Egypt, Arab Rep.  
Gabon  
Gambia, The  
Ghana  
Kenya  
Lesotho  
Liberia  
Libya  
Malawi  
Mali  
Mauritania  
Mauritius  
Morocco  
Mozambique  
Namibia  
Niger  
Rwanda  
Senegal  
Sierra Leone  
South Africa  
Sudan  
Swaziland  
Tanzania  
Togo  
Tunisia  
Uganda

Zambia  
Zimbabwe  
**Asia:**  
Afghanistan  
Armenia  
Bahrain  
Bangladesh  
Brunei  
Darussalam  
Cambodia  
China  
Cyprus  
Hong Kong SAR,  
China  
India  
Indonesia  
Iran, Islamic Rep.  
Iraq  
Israel  
Jordan  
Kazakhstan  
Korea, Rep.  
Kuwait  
Kyrgyz Republic  
Lao PDR  
Macao SAR,  
China  
Malaysia  
Maldives  
Mongolia  
Myanmar  
Nepal  
Pakistan  
Philippines  
Qatar  
Saudi Arabia  
Singapore

Sri Lanka  
Syrian Arab Re-  
public  
Tajikistan  
Thailand  
Turkey  
United Arab  
Emirates  
Vietnam  
Yemen, Rep.  
**Latin America  
and the Carib-  
bean:**  
Argentina  
Barbados  
Belize  
Bolivia  
Brazil  
Chile  
Colombia  
Costa Rica  
Cuba  
Dominican Repu-  
blic  
Ecuador  
El Salvador  
Guatemala  
Guyana  
Haiti  
Honduras  
Jamaica  
Mexico  
Nicaragua  
Panama  
Paraguay  
Peru

Trinidad and To-  
bago  
Uruguay  
Venezuela, RB

### **Oceania:**

Fiji  
Papua New Gui-  
nea  
Tonga

### **More developed regions:**

Albania  
Australia  
Austria  
Belgium  
Bulgaria  
Canada  
Croatia  
Czech Republic  
Denmark  
Estonia  
Finland  
France  
Germany  
Greece  
Hungary  
Iceland  
Ireland

Italy	Switzerland
Japan	Ukraine
Latvia	United Kingdom
Lithuania	United States
Luxembourg	
Malta	
Moldova	
Netherlands	
New Zealand	
Norway	
Poland	
Portugal	
Romania	
Russian Federa- tion	
Serbia	
Slovak Republic	
Slovenia	
Spain	
Sweden	

## B. List of Developing Countries

Afghanistan	Iran, Islamic Rep.	Sierra Leone
Albania	Iraq	South Africa
Algeria	Jamaica	Sri Lanka
Argentina	Jordan	Sudan
Armenia	Kazakhstan	Swaziland
Bangladesh	Kenya	Syrian Arab Re-
Belize	Kyrgyz Republic	public
Benin	Lao PDR	Tajikistan
Bolivia	Lesotho	Tanzania
Botswana	Liberia	Thailand
Brazil	Libya	Togo
Bulgaria	Malawi	Tonga
Burundi	Malaysia	Tunisia
Cambodia	Maldives	Turkey
Cameroon	Mali	Uganda
Central African	Mauritania	Ukraine
Republic	Mauritius	Vietnam
China	Mexico	Yemen, Rep.
Colombia	Moldova	Zambia
Congo, Rep.	Mongolia	Zimbabwe
Costa Rica	Morocco	
Cote d'Ivoire	Mozambique	
Cuba	Myanmar	
Dominican Re-	Namibia	
public	Nepal	
Ecuador	Nicaragua	
Egypt, Arab Rep.	Niger	
El Salvador	Pakistan	
Fiji	Panama	
Gabon	Papua New	
Gambia, The	Guinea	
Ghana	Paraguay	
Guatemala	Peru	
Guyana	Philippines	
Haiti	Romania	
Honduras	Rwanda	
India	Senegal	
Indonesia	Serbia	

## C. List of Countries With Privatizations

Afghanistan	Czech Re- public	Kenya	Romania
Albania	Dominican Republic	Kyrgyz Re- public	Russian Fed- eration
Algeria	Ecuador	Lao PDR	Rwanda
Argentina	Egypt, Arab Rep.	Latvia	Senegal
Armenia	El Salvador	Lesotho	Serbia
Bahrain	Estonia	Libya	Slovak Re- public
Bangladesh	Fiji	Lithuania	Slovenia
Barbados	Gabon	Malawi	South Africa
Belize	Gambia, The	Malaysia	Sri Lanka
Benin	Ghana	Mali	Sudan
Bolivia	Guatemala	Mauritania	Syrian Arab Republic
Brazil	Guyana	Mauritius	Tajikistan
Bulgaria	Haiti	Mexico	Tanzania
Burundi	Honduras	Moldova	Thailand
Cameroon	Hungary	Morocco	Tunisia
Central Afri- can Republic	India	Mozambique	Turkey
Chile	Indonesia	Namibia	Uganda
China	Iran, Islamic Rep.	Nepal	Ukraine
Colombia	Iraq	Nicaragua	Uruguay
Colombia	Jamaica	Niger	Vietnam
Congo, Rep.	Jordan	Pakistan	Yemen, Rep.
Costa Rica	Kazakhstan	Panama	Zimbabwe
Cote d'Ivoire		Peru	
Croatia		Philippines	
Cuba		Poland	

## D. Privatization Dummy No. 1

<b>Country</b>	<b>Year</b>	Gambia, The	1999	Panama	2008
Afghanistan	2005	Ghana	2008	Peru	2002
Albania	2007	Guatemala	1998	Philippines	2007
Algeria	2004	<b>Country</b>	<b>Year</b>	Poland	2000
Argentina	1999	Guyana	1998	Romania	2006
Armenia	1997	Haiti	1999	<b>Country</b>	<b>Year</b>
Bahrain	1994	Honduras	2007	Russian	
Bangladesh	2005	Hungary	2005	Federation	2006
Barbados	1992	India	2004	Rwanda	2007
Belize	2001	Indonesia	1995	Senegal	2007
Benin	2007	Iran, Islamic		Serbia	2006
Bolivia	2007	Rep.	2008	Slovak	
Brazil	1998	Iraq	2007	Republic	2000
Bulgaria	2004	Jamaica	2001	Slovenia	2007
Burundi	1993	Jordan	2000	South Africa	2003
Cameroon	2001	Kazakhstan	1997	Sri Lanka	2003
Central Afri-		Kenya	2008	Sudan	2003
can Republic	2007	Kyrgyz		Syrian Arab	
Chile	1999	Republic	1996	Republic	2001
China	2006	Lao PDR	1993	Tajikistan	2005
Colombia	2007	Latvia	1998	Tanzania	2001
Congo, Rep.	2000	Lesotho	2001	Thailand	2001
Costa Rica	2005	Libya	2007	Tunisia	2006
Cote d'Ivoire	1997	Lithuania	2006	Turkey	2005
Croatia	2007	Malawi	2006	Uganda	2000
Cuba	1994	Malaysia	1992	Ukraine	2005
Czech		Mali	2002	Uruguay	2006
Republic	2002	Mauritania	2001	Vietnam	2008
Dominican		Mauritius	2001	Yemen, Rep.	2006
Republic	1999	Mexico	2007	Zimbabwe	2001
Ecuador	2008	Moldova	2000		
Egypt, Arab		Morocco	2004		
Rep.	1999	Mozambique	2003		
El Salvador	1998	Namibia	2007		
Estonia	1999	Nepal	2000		
Fiji	2002	Nicaragua	2000		
Gabon	2007	Niger	2007		
		Pakistan	2005		



## E. Privatization Dummy No. 2

<b>Country</b>	<b>Year</b>				
Afghanistan	2005	Guyana	1997	Russian	
Albania	1995	Haiti	1998	Federation	2000
Algeria	1996	Honduras	1988	Rwanda	2005
Argentina	1988	<b>Country</b>	<b>Year</b>	Senegal	2000
Armenia	1991	Hungary	1989	Serbia	2002
Bahrain	1994	India	1991	Slovak	
Bangladesh	1989	Indonesia	1991	<b>Country</b>	<b>Year</b>
Barbados	1991	Iran, Islamic		Republic	2000
Belize	1988	Rep.	1993	Slovenia	2007
Benin	1988	Iraq	2007	South Africa	2000
Bolivia	1992	Jamaica	1988	Sri Lanka	2001
Brazil	1988	Jordan	1995	Sudan	2001
Bulgaria	1991	Kazakhstan	1994	Syrian Arab	
Burundi	1992	Kenya	1988	Republic	2001
Cameroon	1996	Kyrgyz		Tajikistan	2005
Central Afri-		Republic	1996	Tanzania	2001
can Republic	2007	Lao PDR	1990	Thailand	2000
Chile	1988	Latvia	1992	Tunisia	2000
China	1991	Lesotho	1999	Turkey	2000
Colombia	1991	Libya	2007	Uganda	2000
Congo, Rep.	2000	Lithuania	1992	Ukraine	2000
Costa Rica	1988	Malawi	1995	Uruguay	2000
Cote d'Ivoire	1991	Malaysia	1988	Vietnam	2004
Croatia	1992	Mali	1996	Yemen, Rep.	2000
Cuba	1994	Mauritania	1995	Zimbabwe	2001
Czech		Mauritius	2001		
Republic	1990	Mexico	2000		
Dominican		Moldova	2000		
Republic	1999	Morocco	2000		
Ecuador	1993	Mozambique	2002		
Egypt, Arab		Namibia	2007		
Rep	1993	Nepal	2000		
El Salvador	1998	Nicaragua	2000		
Estonia	1992	Niger	2000		
Fiji	1996	Pakistan	2001		
Gabon	1997	Panama	2008		
Gambia, The	1999	Peru	2000		
Ghana	1989	Philippines	2000		
Guatemala	1989	Poland	2000		
		Romania	2000		

## F. Privatization Dummy No. 3: Thresholds

<b>Country</b>	<b>Threshold</b>	<b>Year</b>			
Afghanistan	0.64%	2005	Kyrgyz Republic	5.13%	1996
Albania	1.73%	2007	Lao PDR	0.79%	1993
Argentina	7.57%	1999	<b>Country</b>	<b>Threshold</b>	<b>Year</b>
Armenia	6.07%	1997	Latvia	3.01%	1998
Barbados	0.74%	1992	Lesotho	1.37%	2001
Belize	5.49%	2001	Lithuania	3.03%	2006
Benin	1.46%	2007	Malawi	1.10%	2006
Bolivia	21.98%	2007	Malaysia	1.76%	1992
Brazil	0.68%	1998	Mali	0.97%	2002
Bulgaria	2.61%	2004	Mauritania	3.06%	2001
Central African Republic	0.76%	2007	Mauritius	4.71%	2001
Chile	0.99%	1999	Moldova	1.19%	2000
China	0.87%	2006	Morocco	4.38%	2004
Colombia	1.68%	2007	Mozambique	1.26%	2003
Cote d'Ivoire	1.16%	1997	Nicaragua	2.12%	2000
Croatia	2.76%	2007	Niger	1.94%	2007
Cuba	2.71%	1994	Pakistan	2.37%	2005
Czech Republic	3.21%	2002	Panama	0.56%	2005
Dominican Republic	0.78%	1999	Philippines	1.25%	2002
Ecuador	1.02%	2008	Poland	1.24%	2007
Egypt, Arab Rep.	0.58%	1999	Romania	6.30%	2000
El Salvador	2.06%	1998	Russian Federation	1.29%	2006
Estonia	2.45%	1999	Rwanda	3.55%	2006
Fiji	1.00%	2002	Senegal	2.14%	2007
Gabon	0.85%	2007	Serbia	6.97%	2007
Ghana	6.83%	2008	Slovak Republic	5.09%	2006
Guatemala	3.21%	1998	Slovenia	1.11%	2002
Guyana	2.99%	1998	Sudan	0.75%	2003
Honduras	0.73%	2007	Tanzania	0.56%	2005
Hungary	2.07%	2005	Tunisia	6.60%	2001
Indonesia	0.77%	1995	Turkey	1.36%	2006
Iraq	2.24%	2007	Uganda	0.51%	2005
Jordan	5.50%	2000	Ukraine	5.57%	2000
Kazakhstan	13.72%	1997	Uruguay	0.92%	2005
Kenya	3.63%	2008	Yemen, Rep.	1.24%	2008
			Zimbabwe	1.08%	2006

## G. List of Categories

### **Low-Income Countries:**

Afghanistan  
Benin  
Burkina Faso  
Burundi  
Cambodia  
Central African Republic  
Congo, Dem. Rep.  
Gambia, The  
Haiti  
Korea, Dem. Rep.  
Liberia  
Malawi  
Mali  
Mozambique  
Niger  
Rwanda  
Sierra Leone  
Somalia  
Tanzania  
Togo  
Uganda  
Zimbabwe

### **Middle-Income Countries:**

Albania  
Algeria  
Armenia  
Bangladesh  
Belize  
Bolivia  
Botswana  
Brazil  
Bulgaria  
Cameroon  
China  
Colombia  
Congo, Rep.  
Costa Rica  
Cote d'Ivoire

Cuba  
Dominican Republic  
Ecuador  
Egypt, Arab Rep.  
El Salvador  
Fiji  
Gabon  
Ghana  
Guatemala  
Guyana  
Honduras  
India  
Indonesia  
Iran, Islamic Rep.  
Iraq  
Jordan  
Kazakhstan  
Kenya  
Kyrgyz Republic  
Lao PDR  
Lesotho  
Libya  
Malaysia  
Maldives  
Mauritania  
Mauritius  
Mexico  
Moldova  
Mongolia  
Morocco  
Myanmar  
Namibia  
Nicaragua  
Pakistan  
Panama  
Papua New Guinea  
Paraguay  
Peru  
Philippines  
Romania  
Samoa

Senegal  
Serbia  
South Africa  
Sri Lanka  
Sudan  
Swaziland  
Syrian Arab Republic  
Tajikistan  
Thailand  
Tonga  
Tunisia  
Turkey  
Ukraine  
Vietnam  
Yemen, Rep.  
Zambia

### **High-Income Countries:**

Argentina  
Australia  
Austria  
Bahrain  
Barbados  
Belgium  
Brunei Darussalam  
Canada  
Chile  
Croatia  
Cyprus  
Czech Republic  
Denmark  
Estonia  
Finland  
France  
Germany  
Greece  
Hong Kong SAR, China  
Hungary  
Iceland  
Ireland  
Israel

Italy  
Japan  
Korea, Rep.  
Kuwait  
Latvia  
Lithuania  
Luxembourg  
Macao SAR, China  
Malta  
Netherlands  
New Zealand  
Norway  
Poland  
Portugal  
Qatar  
Russian Federation  
Saudi Arabia  
Singapore  
Slovak Republic  
Slovenia  
Spain  
Sweden  
Switzerland  
Trinidad and Tobago  
United Arab Emirates  
United Kingdom  
United States  
Uruguay  
Venezuela, RB

**Fragile and Conflict Affected Situations:**

Afghanistan  
Burundi  
Central African Republic  
Congo, Dem. Rep.  
Cote d'Ivoire  
Gambia, The  
Haiti  
Iraq  
Liberia  
Libya  
Mali  
Myanmar

Sierra Leone  
Sudan  
Syrian Arab Republic  
Togo  
Yemen, Rep.  
Zimbabwe

**Heavily Indebted Poor Countries:**

Afghanistan  
Benin  
Bolivia  
Burundi  
Cameroon  
Central African Republic  
Congo, Dem. Rep.  
Congo, Rep.  
Cote d'Ivoire  
Gambia, The  
Ghana  
Guyana  
Haiti  
Honduras  
Liberia  
Malawi  
Mali  
Mauritania  
Mozambique  
Nicaragua  
Niger  
Rwanda  
Senegal  
Sierra Leone  
Sudan  
Tanzania  
Togo  
Uganda  
Zambia

**IBRD countries:**

Albania  
Algeria  
Argentina  
Armenia

Belize  
Botswana  
Brazil  
Bulgaria  
Chile  
China  
Colombia  
Costa Rica  
Croatia  
Dominican Republic  
Ecuador  
Egypt, Arab Rep.  
El Salvador  
Fiji  
Gabon  
Guatemala  
India  
Indonesia  
Iran, Islamic Rep.  
Iraq  
Jordan  
Kazakhstan  
Korea, Rep.  
Libya  
Malaysia  
Mauritius  
Mexico  
Morocco  
Namibia  
Panama  
Paraguay  
Peru  
Philippines  
Poland  
Romania  
Russian Federation  
Serbia  
South Africa  
Swaziland  
Syrian Arab Republic  
Thailand  
Trinidad and Tobago  
Tunisia  
Turkey

Ukraine  
Uruguay  
Venezuela, RB

**IDA countries:**

Afghanistan  
Bangladesh  
Benin  
Burundi  
Cambodia  
Central African Republic  
Congo, Dem. Rep.  
Cote d'Ivoire  
Gambia, The  
Ghana  
Guinea  
Guyana  
Haiti  
Honduras  
Kenya  
Kyrgyz Republic  
Lao PDR  
Lesotho  
Liberia  
Malawi  
Maldives  
Mali  
Mauritania  
Mozambique  
Myanmar  
Nicaragua  
Niger  
Rwanda  
Senegal  
Sierra Leone  
Sudan  
Tajikistan  
Tanzania  
Togo  
Tonga  
Tuvalu  
Uganda  
Yemen, Rep.  
Zambia

**Least Developed Countries:**

Afghanistan  
Bangladesh  
Benin  
Burundi  
Cambodia  
Central African Republic  
Congo, Dem. Rep.  
Gambia, The  
Guinea  
Haiti  
Lao PDR  
Lesotho  
Liberia  
Malawi  
Mali  
Mauritania  
Mozambique  
Myanmar  
Niger  
Rwanda  
Senegal  
Sierra Leone  
Sudan  
Tanzania  
Togo  
Uganda  
Yemen, Rep.  
Zambia

## H. Correlation Matrix

*Table 15 – Correlation Matrix*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
Initial GDP	(1)	1.00														
GDP per capita Growth	(2)	-0.04	1.00													
Investment	(3)	0.07	0.25	1.00												
Government Spending	(4)	0.02	-0.10	0.23	1.00											
Trade	(5)	0.02	0.08	0.33	0.35	1.00										
Average Years of Schooling	(6)															
		0.44	0.08	0.18	0.04	0.37	1.00									
Use of IMF Credit	(7)	0.23	0.01	-0.01	-0.05	-0.09	0.22	1.00								
Life Expectancy	(8)	0.41	0.16	0.31	-0.08	0.21	0.70	0.23	1.00							
Population Growth	(9)	-0.30	-0.06	-0.12	0.02	-0.19	-0.61	-0.20	-0.40	1.00						
after_pri	(10)	-0.02	0.05	0.06	-0.04	0.10	0.21	0.20	0.17	-0.13	1.00					
after_pri2	(11)	0.06	0.12	0.06	-0.06	0.10	0.44	0.20	0.37	-0.30	0.55	1.00				
after_pri35	(12)	0.15	0.09	0.02	0.03	0.11	0.40	0.17	0.23	-0.25	0.27	0.28	1.00			
after_pri31	(13)	0.11	0.09	0.05	0.06	0.25	0.39	0.15	0.25	-0.28	0.48	0.50	0.56	1.00		
after_pri305	(14)	0.06	0.11	0.07	0.01	0.20	0.37	0.22	0.28	-0.26	0.63	0.60	0.46	0.83	1.00	
after_pri301	(15)	0.03	0.11	0.10	-0.01	0.18	0.38	0.22	0.31	-0.28	0.69	0.69	0.41	0.73	0.88	1.00

## I. List of All Variables Included in the Data <sup>31</sup>

**GDP per capita Growth :** Change in the logarithm of GDP per capita (constant 2005 US\$).

GDP per capita is gross domestic product divided by midyear population. [Series Name: NY.GDP.PCAP.KD]. Source: World Bank Development Indicators.

**Initial GDP:** Initial GDP per Capita. This is the first observation of GDP (constant 2005 US\$). (Series Name for GDP: NY.GDP.MKTP.KD). This varies from country to country.

**Natural Logarithm of GDP:** The natural logarithm of GDP (constant 2005 US\$).

**Investment:** Gross capital formation (% of GDP). Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. (Series Name: NE.GDI.TOTL.ZS). Source: World Bank Development Indicators.

**Government Spending:** General government final consumption expenditure (% of GDP). General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). (Series Name: NE.CON.GOV.T.ZS). Source: World Bank Development Indicators.

**Trade:** Trade (% of GDP). Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. (Series Name: NE.TRD.GNFS.ZS). Source: World Bank Development Indicators.

**Average Years of Schooling:** Education Attainment for Population Aged 15 and Over. Source: Barro and Lee (2010).

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<sup>31</sup> All comments are edited excerpts from the World Bank Development Indicators description, except for the Barro-Lee dataset and comments for Initial GDP.

**Use of IMF Credit:** Use of IMF credit (DOD, current US\$). Use of IMF credit denotes members' drawings on the IMF other than amounts drawn against the country's reserve tranche position. (Series Name: DT.DOD.DIMF.CD). Source: World Bank Development Indicators.

**Life Expectancy:** Life expectancy at birth, total (years). Life expectancy at birth indicates the average number of years a newborn infant would live. (Series Name: SP.DYN.LE00.IN). Source: World Bank Development Indicators.

**Population Growth:** Annual population growth rate for year t is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage. Population is based on all residents who live in the country. (Series Name: SP.POP.GROW). Source: World Bank Development Indicators.



## J. Detailed List of Sectors

The following is directly quoted from the paragraph underneath the headline “Sectors” in World Bank (2015b):

- *Energy*, which includes the exploration, extraction, and refinement of hydrocarbons, oil, and natural gas.
- *Financial*, which includes banks, insurance, real estate, and other financial services.
- *Infrastructure*, which includes transportation, water and sewerage, telecommunications, natural gas transmission and distribution, and electricity generation, transmission, and distribution.
- *Manufacturing and services*, which includes agribusiness, cement, chemicals, construction, steel, hotels, tourism, airlines, maritime services and other sub-sectors that are not infrastructure or finance related.
- *Primary*, which includes the extraction, refinement and sale of primary minerals and metals such as coal and iron ore.

Furthermore, World Bank (2015b) also disaggregate the data into these sectors when the companies are not easily categorized into the sectors above:

- *Competitive*, which includes companies operating in the oil industry, agriculture, tobacco, and transportation.
- *Other*, which includes companies that cannot be placed into the categories above.
- *Services*, which includes companies operating in the service industry.
- *Telecommunications*, which includes telecommunications companies.

## K. Table for comparing Initial GDP with the LN(GDP) in Table 5

*Table 16 – Baseline Results with Initial GDP*

	(1)	(2)	(3)
	Baseline - POLS	Life - POLS	Full - POLS
Privatization	0.0757 (0.329)	0.0953 (0.343)	0.104 (0.332)
Initial GDP	-5.74e-05*** (1.79e-05)	-7.45e-05*** (1.52e-05)	
Investment	0.150*** (0.0207)	0.137*** (0.0202)	0.139*** (0.0202)
Government Spending	-0.0925*** (0.0207)	-0.0851*** (0.0197)	-0.0907*** (0.0203)
Average Years of Schooling	0.137*** (0.0431)		
Trade	0.00352** (0.00172)	0.00321* (0.00178)	0.00362** (0.00179)
Life Expectancy		0.0657*** (0.0113)	0.0510*** (0.0122)
Population Growth			-0.211* (0.108)
Constant	-0.375 (0.972)	-3.313*** (1.040)	-2.022 (1.301)
Observations	5,748	5,645	5,640
Countries	142	142	142
R-squared	0.141	0.148	0.150

Notes: This table reports the dynamic POLS estimations. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## L. Finding Optimal Number of Lags of GDP per capita Growth

Table 17 – Finding Optimal Number of Lags of GDP per capita Growth

	(1)	(2)	(3)	(4)	(5)
	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5
L.gdp_growth	0.202** (0.0789)	0.181** (0.0749)	0.181** (0.0782)	0.180** (0.0808)	0.174** (0.0816)
L2.gdp_growth		0.0754*** (0.0223)	0.0681*** (0.0222)	0.0725*** (0.0225)	0.0752*** (0.0234)
L3.gdp_growth			0.0550*** (0.0172)	0.0559*** (0.0165)	0.0602*** (0.0173)
L4.gdp_growth				-0.0158 (0.0146)	-0.0167 (0.0136)
L5.gdp_growth					-0.0204 (0.0162)
Constant	2.244*** (0.596)	1.391*** (0.502)	2.028*** (0.597)	2.132*** (0.484)	2.163*** (0.489)
Observations	5,991	5,861	5,731	5,601	5,471
Countries	130	130	130	130	130
R-squared	0.170	0.180	0.186	0.187	0.189
Adj. R-squared	0.144	0.1532	0.159	0.160	0.160
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table reports GDP per capita Growth regressed on its lagged values. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## M. Comparison Initial GDP and the LN(GDP) in Table 6

*Table 18 - Dynamic Results with Initial GDP*

	(1)	(2)	(3)
	Dynamic - Baseline	Dynamic - Life	Dynamic - Full
Privatization	0.246 (0.313)	0.205 (0.330)	0.114 (0.313)
Initial GDP	0 (0)	0 (0)	0 (0)
Investment	0.100*** (0.0297)	0.0969*** (0.0307)	0.105*** (0.0293)
Government Spending	-0.385 (1.623)		-0.126 (1.602)
Average Years of Schooling	-0.151*** (0.0493)	-0.170 (0.125)	-0.150*** (0.0490)
Trade	0.0379*** (0.0108)	0.0376*** (0.0107)	0.0372*** (0.0110)
Life Expectancy		0.234 (0.201)	
Population Growth			0.150 (0.363)
Constant	2.170* (1.188)	-2.319 (1.681)	3.724** (1.440)
Observations	5,239	5,145	5,228
Countries	130	130	130
R-squared	0.283	0.286	0.287
Adj. R-squared	0.255	0.258	0.259
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Notes: This table reports the dynamic panel regressions. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## N. Table 8 with Privatization 3 (1)

*Table 19 – Regional Groups II*

	(1)	(2)	(3)	(4)	(5)
	Africa	Asia	Latin America and the Caribbean	Oceania	More Developed Regions
Privatization 3 (1)	1.731 (1.519)	2.452 (2.714)	-0.724 (0.820)	0 (0)	2.762** (1.192)
Investment	0.143*** (0.0359)	0.126 (0.0996)	0.0836 (0.0604)	0.211 (0.0841)	0.0898* (0.0463)
Life Expectancy	-0.890 (1.283)	-0.672 (0.646)	-4.860 (3.192)	0.356 (31.54)	0.262 (0.221)
Government Spending	-0.0318 (0.117)	-0.134 (0.139)	-0.122* (0.0685)	0.176 (0.263)	-0.768*** (0.231)
Trade	-0.0921** (0.0441)	0.0294 (0.0180)	-0.0138 (0.0291)	-0.00724 (0.0607)	0.0725*** (0.0213)
Population Growth	-0.0639 (0.922)	-0.350 (0.366)	-2.285 (2.118)	-5.457* (1.762)	-0.130 (0.573)
Constant	68.85*** (20.78)	114.9*** (35.83)	78.72*** (18.28)	508.5** (67.92)	142.1*** (30.95)
Observations	1,527	1,187	1,047	114	1,259
Countries	36	34	23	3	34
R-squared	0.239	0.418	0.429	0.650	0.663
Adj. R-squared	0.183	0.363	0.374	0.100	0.634
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in regional subsamples. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## O. Table 10 with Privatization 3 (1)

Table 20 – *Developing Countries II and Income Groups II*

	(1)	(2)	(3)	(4)
	Developing Countries	Low In- come	Middle Income	High Income
Privatization 3 (1)	1.838 (1.112)	0 (0)	2.112* (1.105)	-0.0659 (0.226)
L2.lngdp	-3.657*** (0.929)	-5.438*** (1.004)	-3.368*** (0.932)	-2.321*** (0.730)
Investment	0.147*** (0.0361)	0.155** (0.0620)	0.147*** (0.0417)	-0.00752 (0.0356)
Life Expectancy	-0.319 (0.654)	-0.990 (3.124)	0.530 (0.616)	-0.0437 (0.232)
Government Spending	-0.108 (0.122)	0.128 (0.103)	-0.163** (0.0767)	-0.480*** (0.133)
Trade	0.0368*** (0.0127)	-0.0780 (0.0741)	0.0407*** (0.0142)	0.0306* (0.0153)
Population Growth	0.709** (0.314)	1.589 (1.245)	0.437 (0.395)	-1.062*** (0.116)
Constant	81.33*** (21.88)	103.7*** (20.84)	80.37*** (23.23)	62.48*** (16.59)
Observations	3,344	689	2,664	1,781
Countries	85	18	67	45
R-squared	0.288	0.255	0.353	0.543
Adj. R-squared	0.254	0.150	0.319	0.512
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in subsamples by income level. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. Column (1) is equal to column (2) in table 9. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## P. Table 11 with Privatization 3 (1)

*Table 21 – Other Categories II*

	(1)	(2)	(3)	(4)	(5)
	IBRD	IDA	LDC	Fragile	HIPC
Privatization 3 (1)	1.220 (0.923)	7.382** (2.850)	0 (0)	0 (0)	3.292** (1.234)
L2.lngdp	-3.278*** (0.814)	-5.536*** (1.405)	-4.478*** (0.965)	-5.815*** (1.184)	-4.868*** (1.006)
Investment	0.155** (0.0670)	0.0969** (0.0422)	0.0718* (0.0402)	0.281** (0.107)	0.162*** (0.0436)
Life Expectancy	-0.0797 (0.555)	0.472 (1.160)	-0.0360 (2.114)	-8.740* (4.210)	-1.444 (2.587)
Government Spending	-0.338 (0.269)	-0.0380 (0.113)	0.0370 (0.104)	0.190 (0.142)	0.00458 (0.102)
Trade	0.0585** (0.0227)	-0.0410 (0.0395)	-0.0660 (0.0545)	-0.0850 (0.0800)	-0.0476 (0.0474)
Population Growth	-0.538 (0.687)	1.640* (0.854)	2.034* (1.006)	3.994* (1.884)	0.919 (1.197)
Constant	77.59*** (20.51)	116.5*** (31.28)	92.85*** (20.80)	113.7*** (23.85)	101.8*** (21.10)
Observations	1,947	1,305	941	510	1,154
Countries	48	34	25	14	27
R-squared	0.402	0.261	0.237	0.276	0.225
Adj. R-squared	0.364	0.198	0.155	0.139	0.157
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression in subsamples by other categories. Coefficients on lagged, lagged differenced and differenced variables are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.

## Q. Table 11 With Other Dummy Variables For Privatization

*Table 22 – Industries II*

	(1)	(2)	(3)
	Privatization 3 (2)	Privatization 3 (3)	Privatization 3 (4)
Competitive	2.420 (3.671)	2.432 (3.682)	1.456 (2.602)
Energy	1.402 (0.890)	1.470 (0.901)	1.204 (0.742)
Financial	1.389*** (0.518)	2.676*** (0.752)	2.588*** (0.591)
Infrastructure	0.451 (0.381)	0.383 (0.346)	0.332 (0.335)
Manufacturing	0 (0)	1.182 (0.760)	1.226 (0.777)
Other	0 (0)	0 (0)	-0.885 (0.631)
Primary	1.394*** (0.400)	1.473*** (0.411)	1.479*** (0.422)
Services	12.70*** (0.935)	12.74*** (0.927)	0.519 (3.713)
Telecommunications	4.951*** (0.628)	5.033*** (0.640)	4.952*** (0.639)
Observations	5,134	5,134	5,134
Countries	130	130	130
R-squared	0.315	0.316	0.312
Adj. R-squared	0.287	0.287	0.283
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Notes: This table reports the full dynamic panel regression with privatization divided into industries. All industries categories represent the effect of privatization, if it were to happen only in that category. Coefficients on lagged, lagged differenced and differenced variables are not reported. Coefficients on control variables and the constant are not reported. Robust standard errors are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 indicate levels of significance. Country and year fixed effects are not reported.