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The role of local and regional governments in  
investment growth and productivity enhancement in  
Mexico

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Submitted in fulfilment of the requirements for the  
Degree of Doctor in Philosophy

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## *Abstract*

This thesis examines the influence of local and regional governments in investment growth and productivity in Mexico. A combination of quantitative and qualitative analysis is used with the aim of assessing their influence and tools. Mexican municipalities and states have gained major participation in policy making, investment fostering and infrastructure building. The decentralised resources to meet these goals have increased considerably; as a consequence, it becomes imperative to measure the actual effects of such resources as well as to identify the opportunity areas to develop.

The first part of the empirical analysis, attempts to measure the influence of local governments' expenditures on private investment growth, as well as to identify the most important investment drivers. Likewise, given the increasing foreign investments landing in Mexico, there is a potential regional competition between cities, this is also evaluated. A panel data analysis consistent with cross section dependence is carried out for 63 Metropolitan Areas (MA)/cities for the period 1993-2008. The econometric analysis shows that, municipal governments' expenditures have had a substantial effect on private capital. In addition, competition strategies matters. More importantly, public infrastructure stock is revealed as a central determinant for investment, especially for manufacturing firms.

The second empirical chapter evaluates whether municipal and state expenditures in economic policies have boosted productivity of firms. Firms and regional features are also included in the estimation models. Panel data analysis consistent to cross section dependence is used, for 63 MA/cities and 29 states. The results showed that the policies implemented in municipalities have had little or even negative effects over firms' productivity. Meanwhile, the policies implemented by states have had larger influence on productivity increases.

In order to dig deeper into the role of local and regional governments in economic policies, two case studies –Hermosillo and Mexicali- are presented in the last part. Empirical models cannot tell about the local processes, as the data used is only expenditures. The fieldwork undertaken helped to identify the most significant policies followed in each city, as well as the leadership and organisation of stakeholders. The main finding suggests that local participation and overcoming political cycle is essential for the long-term success; and easing doing business for firms, rather than incentives, is more effective to spur private investment.

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### Author's declaration

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

## Definitions and abbreviations

AMMAC (Asociacion de Maquiladoras de Mexicali A. C) Maquiladoras Association of Mexicali

CANCINTRA (Camara Nacional de Industria de la Transformación) National Chamber of the Transformation Industry

CCE (Consejo Coordinador Empresarial) Business Coordinating Committee

CDI (Consejo de Desarrollo Industrial) Council for Industrial Development

CEDEM (Consejo de Desarrollo Económico de Mexicali) Council for the Economic Development of Mexicali

CIAD (Centro de Investigación en Alimentación y Desarrollo) Research Centre for Food and Development

COLEF (Colegio de la Frontera Norte) College of the North-bordering Region

COMEIA (Consejo Mexicano de Educación Aeroespacial) Mexican Council for Aerospace training

CONACYT (Consejo Nacional de Ciencia y Tecnología) Mexican Council for Science and Techonology

CONAPO (Consejo Nacional de Poblacion) National Council for Population

CONEVAL (Consejo Nacional de Evaluacion de la Politica de Desarrollo Social) National Council for the Evaluation of Social Development Policies

COPRESON (Consejo Para el Desarrollo Economico de Sonora) Council for the Economic Development of Sonora

DESEC (Desarrollo Economico del Estado de Chihuahua) Economic Development of Chihuahua State

FEMIA (Federación Mexicana de la Industria Aeroespacial) Mexican Federation of Aerospace Industry

IMPLAN (Instituto Municipal de Planeación) Municipal Institute for planning

INEGI (Instituto Nacional de Estadística y Geografía) National Bureau of Statistics and Geography

PAN (Partido Acción nacional) National Action Party

PRI (Partido Revolucionario Institucional) Institutional Revolutionary Party

PRONASOL (Programa Nacional de Solidaridad) National Programme of Solidarity

SEDESOL (Secretaria de Desarrollo Social) Social Development Department

## Chapter 1 Introduction

### 1. Decentralisation and political changes towards bottom-up policies implementation in Mexico.

It has been widely acknowledged that in the last four decades there has been a leading trend to intensify fiscal and political decentralisation in favour of local and regional governments expecting to induce reductions in regional income disparities within countries (Im, 2010, Treasury, 2004). This process has been even intensified in the last 25 years, given the failure of national policies, or the so-called top-down approach (Tomaney et al., 2010). The analysis of regions and cities has led to reveal that *one fit all* policies are not helpful enough when attending local needs. Especially, decentralisation might improve the management efficiency and quality of services delivered to citizens (Oates and Schwab, 1988, Giugale and Webb, 2000).

Increasing the participation of local governments as well as other key actors in promoting local economic development has been especially remarked by the Local Economic Development (LED) literature, which had been widely advised to Latin American countries (Ruiz D., 2000, Enríquez Villacorta, 2006). Competitiveness literature, and more particularly, the systemic competitiveness approach, claim that collective actions will build up a more solid competitiveness with larger effects in the long term (Esser et al., 1996).

Decentralisation efforts started in Mexico in the 70's and have been intensified throughout the years, especially during the 90's. In addition, during the 1980 and 1990 decades, Mexico started the widely known economic liberalisation, which maximum expression was the signing of the North American Free Trade Agreement (NAFTA) in 1994. Together with different programs to increase participation of local citizens in planning and policies implementation, during the 90's decade the fiscal decentralisation was largely intensified, endowing local and especially state governments with pecuniary resources and channels to manage regional planning, services delivering, economic fostering activities, and public infrastructure building. There were agreements to allow states to set taxes, but in practice, there used to be a high centralisation of tax and oils revenues (Courchene and Díaz-Cayeros, 2000). In the case of municipalities, the modification to the constitution undertaken in 1983 granted them the responsibility of delivering local services. It also

endowed them to freely spend their resources and increase local revenues. But similarly to the states, they continued without the resources to take charge on their new responsibilities.

During the term in office of the national President Ernesto Zedillo 1994-2000, there was introduced a significant change, that is, the decentralisation of two main tasks: education and health services. It brought an increase of almost 10 times of conditional transfers to states, from 1993-2011. In addition, the unconditional transfers have also increased about 40% for the same period. The fiscal decentralisation has allowed state governments to increase their total incomes up to 2 times from 1993 to 2011, and up to 1.5 for municipalities. More importantly, compared to the state administrations budgets, in 1993 municipalities' total incomes represented about 26% of the states income. By 2011, this proportion grew up to 45%. This came as a result of the federal transfer system which demands states to distribute to municipalities at least 20% of their total unconditional transfers received (Peña-Ahumada, 2011).

It is essential to also remark the changes of the political geography in the last 25 years. Despite that Mexican political system is a democracy, the leading party had remained in power during 60 years in all government levels, and over 70 years in the national presidency. It was in 1989 when for the first time the opposite party, PAN won elections at municipal level. By 1995, 7% of the states and 45% of municipalities were governed by other parties (Costa-I-Font et al., 2003). It was until 2000 when the national president came from a party different to PRI. It entails that, during that period of 11 years 1989-2000, the political geography was dramatically transformed.

As a result, on the one side, there was more than ever the chance to incur in Pork-Barrel politics, especially considering that politicians were not used to work with a different party along the government structures. Governors, municipalities, deputies, and senates had to bargain and seek consensual decisions, which was not necessary before, when the president had the power to control most decisions and almost everyone used to agree due to the so called presidentialism lived in Mexico and other Latin American countries in the twentieth century, see Mainwaring and Shugart (1997).

On the other side, given the divergence in parties and the occurrence of Pork-Barrel politics, it became mandatory to institutionalise mechanisms to endow state and municipalities with major pecuniary resources and political powers to act on their behalf.

In consequence, the criteria in the distribution of federal transfers were reformed to reduce discretionary favouritism prevalent before (Giugale and Webb, 2000). Gradual modifications occurred, the most significant reforms to the formula happened in 2003 and 2007. The latter introduced incentives to states that have improved their management tasks in the previous period (Peña-Ahumada, 2011). The new formula rewards with major resources state which achieve better economic growth, under the assumption that it is a result of actively promotion of regional growth. Better education indicators, as well as greater total tax collection and tax collection growth, are also awarded. In parallel, there are 10% of the total funds to be distributed to those in worse position according to the mentioned criteria, with a compensation aim.

Together with the provision of funds, the federal government has fostered to sates and municipalities, particularly the latter, to improve planning tasks. As a result, there has been encouraged the creation of local and regional departments to formulate and implement economic policies, support domestic and foreign firms, participate in marketing fairs, as well as any other task regarding to economic policies.

Urban planning formulated on behalf of the municipalities have been also fostered by the creation of IMPLAN's (Municipal Institute for Planning; Instituto Municipal de Planeacion). The offices created are linked through different associations to also coordinate the municipal and state planning offices for tourism, economics and urban planning.

Methods to assess and foster such practices have also emerged. Namely, from the academic sector, there is a yearly award running from 2000, organised by the association of various non- governmental institutions, mostly universities. The prize is given to local governments which implement reforms in management that significantly improve their administration. Also, the *Doing Business* project from the World Bank has encouraged local governments to change laws in order to ease the paperwork for firms.

From the federal government, INEGI has created the Government Censuses (Censos de Gobierno) from 2011 onwards to register the extent to which local and state governments undertake planning activities in view the evaluation of their territory. The census also attempts to find out whether governments evaluate the results obtained at the end of the year compared to the objectives established on their plans. In other words, the aim of this work is to assess the planning and management work in states and municipalities, seeking

to improve efficiency is policies making, implementation and evaluation. In addition, the registers of local and state expenditures in INEGI data base have been improved to let major disaggregation degree, which in the future may permit to assess the effects of particular expenditure items in the economic growth and wellbeing.

The actual effects of such policies is believed to improve at least the services delivered to communities, since municipalities can build basic infrastructure that is better planned in the municipal institutes, rather than in the federal offices. Yet, it is really hard to isolate the effect of decentralisation in the context of economic liberalisation.

Research works using a set of countries -developed and developing- found that decentralisation fosters inequalities in developing countries (Rodriguez-Pose and Ezcurra, 2010, Im, 2010). In spite of that, research works in Mexico have found that decentralisation has had good effects, although its specific influence over regional inequalities have not been tested yet. Moreno (2013), and Gonzalez-Rivas (2014) have investigated the consequences of decentralisation in rural areas. Moreno (2013) found that decentralisation in Mexico can be related to higher accountability and entrepreneurship behaviour in rural governments. While Gonzalez-Rivas (2013), using a case study in Oaxaca, found that decentralisation may allow local communities to obtain more efficient water services, given the higher engagement of local citizens. However, as regards with the expenditures surplus following fiscal decentralisation, there are no works testing the total effect. This is where the present work finds opportunity to contribute.

## 2. Raise of competition: competing regions, competing governments

The economic liberalisation process has virtually changed all latitudes around the globe. The development of transport and communications technologies has let increasing interactions among countries, leading to a highly integrated global market whereby the distances have become a less significant issue. With 'weaker' barriers among countries due to the market deregulation, firms, cities and regions have been exposed to an intense competition, which Savitch and Kantor (2002) call 'the market commonplace'.

The liberalisation of capital together with the raising of cities and regions pursuing economic growth by attracting firms and human capital to their regions have created the possibility for competition at the regional level, additionally to the intensified competition in the productive and labour markets (Camagni, 2002).

The tools and resources to compete are different depending on the competitor. For instance enterprises must compete through high productivity levels and differentiation in their products; cities and regions have to compete by means of the provision of urban externalities, specialised services to suppliers, and all the facilities that impact the enterprises competitiveness, in order to retain and attract the mobile resources, namely, capital investments and labour force. Countries as a whole have a bigger bunch of instruments to compete, since apart of providing specific infrastructure for the production and well-founded institutions, some countries still have the option to use the currency as instrument to compete. Labour force, find their self into a highly competitive market in which the bunch of skills required have also incremented, not only in the knowledge-based activities, but in general terms (Storper, 1997, OECD, 2001).

The results of the competence could be crude, few participants win while others lose, or stay stagnant. The competition faced by regions has been acknowledged by different scholars, while it has been also highly criticised by others who claim that firms are the only entities facing competition when they face the market (Krugman, 1994, Porter, 1990). Nevertheless, the competition and competitiveness at the city level have become essential task within the policy makers' agenda. It has been recognised that territories actually influence competitiveness of firms (Kresl, 1992, Storper, 1997, Boshma, 2004, Budd, 1998), which thus affects firms' locational decision.

As the wealth generators in economic life, firms' settlement, investment decisions and productivity levels determine regional income. In view of this, public officers, in name of a region or city, seek to influence on firms' location and investment decisions (Thomas, 2000, Markusen, 2007, Cheshire and Gordon, 1998). In addition, given that urban economies yield their wealth creation on human capital to a great extent, cities might also pursue to influence on people inflows.

The ways to influence on such decisions from individuals and firms are diverse given their needs. Firms might be highly interested in domestic markets, transport costs, energy supply, as well as the institutional framework (Kresl and Gappert, 1995, Turok, 2004). While citizens look for urban amenities, especially those highly qualified (Poot, 2000, Castells and Borja, 2000). At this regard, it has been widely discussed that cities with better urban amenities are more likely to attract highly skilled labour force, who might be also risk takers and may have more innovation capacity (Florida, 2003, Capello and

Camagni, 2005). This will enhance an environment in which productivity could be considerably improved, governments hence should take into account that improving urban amenities might bring about larger wealth creation without directly fostering firms.

In consequence, local governments and policy-makers should pursue to improve the production and living conditions to become sticky places, that is, cities/regions capable to retain and attract new mobile resources (Cheshire and Magrini, 2009a). Yet, these strategies are effective only in the mid and long terms, which makes them difficult to implement when terms in office are short, and governments seek for fast results, especially in terms of job creation (Mäding, 2006, Savitch and Kantor, 2002).

Given the economic liberalisation, multinational firms have a wider set of possible place to locate. It causes that firms might find similar cities around the globe; they will thus bargain their settlement when possible. This has triggered competition by using other means apart of competitiveness improvement. This is, bidding wars, tax lowering or exemptions, land provision, financing of labour force training and diverse packages that involves monetary incentives to achieve the settlement of firms. This may usually happen between cities with similar urban endowments and labour force availability in which their additional advantage has to come out of cash incentives (Greenstone et al., 2010).

However, it also happens that firms may invest in less efficient places, given the important incentives received (Thomas, 2003b, Blonigen and Kolpin, 2007). Certainly there is an important discussion about the implications of incentives-based competition policies. In the case of developing countries it is expected that they try to compensate the lack of good infrastructure, institutional framework, human capital, and the existence of corruption or high crime levels. Nonetheless, within developed countries the competence has also occurred, especially in the US given the high degree of independence of the states (Markusen, 2007).

In such cases, the problem lies upon the income disparities that could be enhanced. Namely, rich states would be able to offer larger incentives; therefore, the incentives do not longer have a compensation aim, but they constitute a mean to reinforce uneven economic performance. This types of policies have also generated a race to the bottom, in which the only benefited are the firms, but not the cities, given the large amounts of money spent in

the bid. Also, some claim that offering incentives might also enhance inefficiency within the firm, which for sure is in detriment of the productivity.

In sum, when addressing regional competition, it can be assumed that local actors and stakeholders may act on behalf of a region in order to influence the location decisions of firms and individuals. The competition strategies can be either based upon competitiveness improvement policies, which are long-term strategies; or in incentives-based policies. Indeed, both can be complemented, but governments should seek more vigorously the former to abandon the need to offering cash incentives (Romer, 1993, Cheshire and Gordon, 1998). According to the literature, regional competition mostly arises upon geographical location and economic specialisation (Johansson, 2000). A third field is the competition for urbanisation economies (Budd, 1998). High technology industry and firms producing high value added, especially in the services sectors, or the headquarters seek to be established in cities with high quality of life, and urban amenities.

In this way, with the emergence of local and regional governments as key actors to promote economic development in partnership with upper levels government offices during the last 25 years, competing governments and fields of competition have also arisen in Mexico. Consequently, this has also motivated the present research project.

### 3. Aim of this work

In view of the considerable increase of economic resources in municipal and state government, and given that during 1993-2011, about 30% and 45% of those resources at municipal and state levels, respectively, have been exerted in tasks related directly or indirectly regarding to fostering economic growth; studying the outcomes of such policies has enlarged in importance.

The main kinds of policies implemented could be grouped in three. First, support to firms intending to have a direct effect on their productivity. Among these activities are encountered granting loans; giving administrative consultancy; helping to design a brand and find commercial channels for their products; assisting with advice and financing to commit sanitary or any other type of certification; and mostly ease the paperwork to start a business. Second, provision of pecuniary incentives, grants, land and tax exemptions. It depends on the state or the municipality in question, the economic activity of the firm, and the nature of the investment; whether it is domestic or foreign. At the state level, when it is

a foreign firm, it is also likely to draw upon federal resources that can actually be meaningful for foreign investors, especially in the automotive and the aerospace. Third, improvement of public infrastructure stock, and investment in marketing departments to attract new investors, especially foreign when possible.

A clear example of the fostering competitiveness policies implemented is the generalised creation of local and state economic departments that used to be inexistent 20 years ago. In many places, the offices undertake marketing and promotion by targeting particular firms and offering them attractive package of incentives.

Despite of all the depicted changes, both politically and economically, there is general belief that local and regional governments have very limited capacity to pursue economic growth and foster investment, especially in municipalities. Indeed, federal investment has remained as a significant driver for regional growth in the past (Rodríguez Oreggia y Román, 2003), and in the third chapter this has been confirmed when estimating state level models.

However, if the claim is true, and only federal government can effectively promote economic growth, then fiscal and political decentralisation have been in vain. It would entail that about 30% and 45% of public resources in municipalities and states, respectively have been wasted during 1993-2011, while federal resources are being transferred to support inefficient local administrations (Ezcurra and Rodríguez-Pose, 2012, Correa Gomes et al., 2013). However, larger engagement of local governments have been found positive for Mexican municipalities; in works such as Moreno (2013) and Gonzalez-Rivas (2014) mentioned before. Rodríguez-Pose and Palavicini-Corona (2013) found that human development grew faster in municipalities engaging LED during 1990-2005. In other words, the higher engagement of local stakeholders mattered for human development increases.

Among the aims of the municipal and state offices for economic development are the enhancement of private investment and productivity of firms. Testing the actual effects municipal and state policies over these two variables is the main task of this work. The policies are assessed quantitatively, rather than qualitatively, hence, the expenditures exerted by municipal and state government on such policies are used as the main interest variables.

Besides, cities can be seen as a common place where flows of people, firms and information interact, which success is highly determined by those existing interactions and the institutional framework that serves as a boundary (Castells, 1999). The econometrical models allow gathering information in average expenditures, but differences in specific policies implemented cannot be scrutinised. The registers are not disaggregated, and getting to know the type of offices functioning, whether local departments participate in marketing fairs, or the extent to which stakeholders participate in designing public policies, by carrying on documental research is simply impossible, because local organisation differs all around the country.

Given the institutional organisation, it is also important getting to know the way in which the three partnership scheme shapes the actions at local and regional levels in Mexico. That is, what is the actual path of actions when implementing policies to foster investment as well as the extent to which differences in local institutes might change the policies outcomes. Additionally, in view of different cases of study in which it has been proved that local actors engagement in public matters leads to better policies outcomes, frequently based on internal resources (Lorens et al., 2002, Ruiz D., 2000). In a context of competition policies based on internal and external resources, a deeper understanding about the policies followed and role of local key actors for policies implementation is also essential.

Particularly, there were identified very divergent paths among the cities studied. Fieldwork to benchmark local specific features in two cities has been carried out. Namely, types the strategies followed, the role of planning, means used to support domestic and foreign firms in particular; as well as the bargaining occurred between local/regional public officers and firms representatives.

The ideal would be to have two equal regional entities and assess the differences in outcomes, related to different policies and local features. This is not possible, however, therefore, two cities with similar economic specialisation, economic structure, population-size, political status –state capitals- and geographic location are used for the benchmark.

#### 4. Contribution of this research

The contributions of this research work undertaken are manifold. The specific results obtained with the empirical models are listed in the outline of the thesis. Here are highlighted what in my opinion are the central findings.

This research project underlies its importance in the need of revealing whether local and state administrations in Mexico are capable of fostering better economic performance and development. Meanwhile, the federal government remains as the leader given the institutional framework, better planning and pecuniary resources. Hence, it becomes essential to examine the extent to which municipalities and states serve as promoters as well, and the possible mechanisms to increase their influence.

There have been identified specific tools that municipal and state governments employ to foster economic growth in Mexico. The results exposed that indeed the higher amount of decentralised funds has endowed municipal and state governments to foster economic growth, even if municipalities have fewer incidence on productivity enhancement.

Nonetheless, by means of the econometric models it was confirmed that even after the reforms undertaken, the investment exerted by the federal government has had greater effects on productivity than the investments on behalf of municipalities and states. Additionally, through the fieldwork carried out, it was found that in the case of Mexicali and Hermosillo, top-down policies accompanied by financial resources may trigger much higher economic growth than ground-founded policies, with a bottom-up approach.

These findings, cast doubts on the effectiveness of the proposed development model in which participation of local actors –public or private- is essential, while federal policies work as main drivers for productivity and investment growth enhancement. It suggests that higher decentralisation should be encouraged, given all the potential benefits of it for Mexican municipalities.

The chapter two and three contributes by providing information about incentives given to firms, and subsidies revenues in both, domestic and foreign-own/joint venture firms. It helped to reduce the lack of information on incentives-based policies, and subsidies revenues for firms in developing countries.

Additional to the existing empirical evidence, this thesis provides evidence on the effects of local, regional and federal investments over firms' productivity and their investments

decisions. It was confirmed that the *hard road* competitive strategies should be followed at the regional and local level, since larger effects have been revealed compared to the *soft road* competitive strategies. That is, policies aimed to improve the determinants of regional and firms' competitiveness showed larger influence than Policies to promote investments and provide all kind of incentives for firms, generally to a great discretionarily. Particularly, the case studies analysed confirmed that the engagement from state and municipal administrations could lead to significant transformations in the mid and long-terms. Even if state/federal supported policies might cause grater economic growth, it is also clear that municipal policies with a long-term vision helped to develop more efficient strategies.

## 5. Outline of the thesis

This thesis is organised in the form of three separated journal articles, plus the introduction and conclusions chapters. In consequence, there is no a chapter to discuss the related literature to this thesis, since each chapter has its own theoretical framework section, which is interrelated to each other.

It is important to mention that given the availability of information and the aim of each chapter different disaggregation levels are used. In the second chapter, the models are estimated for municipalities. Given that the dependent variable is the new private investment per employee, it was not possible to get this or a similar variable for states, which is only available for the country or for municipalities in the Economic Censuses. It could have been somehow aggregated, yet, this chapter also attempts to identify competition, and thus city level analysis was considered more appropriated.

In the third chapter the analysis is carried out for cities and states. Given that this time the dependent variable is a measure of productivity, it was considered appropriate to incorporate the role of federal investment in physical assets, which cannot be disaggregated at municipal level, thus state level models were estimated. Perhaps it would have been better to have the expenditures from the three administration levels in each model, but this is not always possible. The whole thesis is organised as follows.

The first chapter, which you are reading on, presents an overview of the whole thesis project, in order to provide a logic explanation about the general aim this research, and set ground for the three articles presented. This chapter delivers a synthesis of the changes

occurred in Mexico that motivated the present research work, and highlights the main contributions.

The second chapter presents a specific study about the effects of public expenditures exerted by the government of the most important cities in the country on private investment increments. The effects of decentralisation and some other empirical papers are discussed. Promptly an econometric model is proposed. The interest variables do not include total expenditures, but those registering the expenses incurred while fostering economic activities by different means, as well as when investing to improve productions conditions.

The chapter highlights that in the context of larger capabilities from local governments to pursue economic development by promoting investment, improving public infrastructure stock, improving institutions; governments can be to immerse in regional competition. Such competition is more likely to happen between cities located nearby, and those with similar economic specialisation. Therefore, two variables are added in the models to identify whether investing more than the close competitors have been beneficial. Namely, if spending larger quantities of resources than other cities have increased the investment levels in the cities in question.

The models are differently estimated for domestic and foreign firms, as well as for total and manufacturing firms. The findings showed that municipal governments have induced private investment growth in the period of study. The effects are larger in manufacturing firms. More importantly, the effects are positive for foreign firms, while negative for national firms. As for foreign firms, proximity to border region and the US market potential are very influential.

The third chapter goes beyond to analyse if some public policies have helped to increase productivity. The literature about the governments interventions states that frequently the type of support offered to firms does not help them to improve their efficiency, quite the opposite, they tend to stimulate inefficiencies inside the firms (Thomas, 2000). Related literature and empirical works are discussed here, and then an econometrical model is proposed.

In this chapter, the analysis is extended to the state and federal levels, because states and federal governments have major capabilities to undertake planning and to carry on bigger

projects that may impact productivity of firms to a greater extent. The empirical analysis is carried out by estimating econometrical models at cities and states levels.

The results showed that municipalities/cities have limited capacity to foster the productivity of firms, while state and especially federal governments are key drivers. In view of that, it was concluded that, even if there has been important advances in decentralisation, central government can still lead the economic performance of regions to a great extent, as it has been remarked by other researchers (Topal, 2013, Chiquiar and Ramos-Francia, 2009) and shown by Rodriguez-Oreggia and Rodriguez-Pose (2004). Particularly, the expenditures on infrastructure showed a negative sign, which could indicate corruption and/or mismanagement of the projects undergoing, which should be tackled.

The fourth chapter reports the findings of the fieldwork undertaken. During the fieldwork sixteen interviews were carried out to get first-hand information about the policies implemented at the local level and the informal institutions existing, this is the actual relationship with other government levels as well as with the private sector, particularly with manufacturing firms. This exercise revealed that the actions held in local levels, can influence economic performance to a great extent, nevertheless, the financial and political support and leadership from state and federal instances could be even more influential. There were identified different political organisations, as well as differences in support to domestic and foreign firms, which could not be identified with the empirical models.

The chapter starts by discussing related literature, and empirical studies in Mexico in which the influence of key local actors has been essential to trigger economic development increases. The chapter addresses the economic and social profile of the cities included in the study. The institutional organisation from the cities are discussed, and there are also described the type of policies to foster investment. Finally a benchmark between the two cities is presented. The conclusions reports that, local actions in Mexicali has led to a greater transformation of the city compared to 1993, even if its economic growth has been less dynamic than Hermosillo in the last 10 years. On its side, Hermosillo has become one of the most successful cities in the country, yet the initiative did not come from the local government, but from the state level, with the support of the federal government. Mexicali showed major engagement with LED strategies, this is, a bottom-up approach in which the leadership comes from local actors which are not precisely policymakers but local

stakeholders. Meanwhile, Hermosillo exhibited policies more in line with the traditional development policies focused on the development of one economic sector, in this case the automotive. In other words, Hermosillo's policies follow the top-down approach, while showing strong support to local firms as recommended by LED literature.

This case casts doubts about the model to be followed, because although the federal administration fosters participation at local levels, it is clear that economic success is faster when there is the support from the federal level. Therefore it constitutes an incentive to engage in the race for getting political support from upper government levels, which could magnify the costs of political cycles and the opportunities for Pork-Barrel politics.

The fifth and final chapter presents the general conclusions of the work and ponders its limitations. Possible further researches that may deepen the results of this research project are also discussed.

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## Chapter 2

### Effects of decentralisation and regional competition on private investment growth: Evidence from Mexican cities

#### *Abstract*

The increasing mobility of capital raises competition between territories in order to attract it within their jurisdiction. Since 1994, the decentralisation process in Mexico has been accelerated by providing municipalities with more expenditure capabilities. In parallel, Mexican municipalities have participated more actively in formulating economic policies. Fiscal decentralisation and major engagement of local government in economic development may allow regions to enhance competitive advantages and increase their attractiveness. In spite of the increasing resources and local participation in policymaking, their effects on investment increments have not been tested yet. In addition, there could be regional competition ongoing; even when municipal governments cannot offer significant amounts of money to firms they use different competition means. This hypothesis has not been tested either. In consequence, this work is aimed to find out to what extent the money exerted at the local level has induced private investment growth, and to test the effects of regional competition, if there exists. A panel data analysis is carried out using data from INEGI for 63 Metropolitan Areas/cities for the period 1993-2008. The models are divided into firms with solely domestic investment and those with foreign investment. The econometric analysis shows that, two major spending items, namely Economic fostering and subsidies, and Public infrastructure investment, have a substantial effect on private capital, but the effects vary depending on the group of firms assessed. In addition, competition strategies matters; the results suggest that municipalities spending more money than their direct competitors have a higher private investment growth. More importantly, public infrastructure stock has been revealed as a central determinant for investment, especially for manufacturing firms.

#### 1. Introduction

It is well known that some cities are more successful than others. Some are in decay while others in boom. The first ones are not highly attractive for new FDI flows and human capital, and they could be incapable to retain the established investment and inhabitants. Successful cities are attractive for firms and people and can be also sticky places given

their business and living conditions (Cheshire and Magrini, 2009). Within competitiveness literature, cities can be called winners or losers given their economic performance (Capello and Camagni, 2005). When the patterns in economic performance remain in the mid and long terms, gains tend to concentrate in few cities. This is especially true for developing countries where urban cities tend to be highly uneven (Storper, 2013).

Mexico has experienced an important process of economic liberalisation bringing about economic growth and increments of the income levels. The effects have been dissimilar and regional income inequalities have been increasing after 1980, when the economic liberalisation started (Rodríguez-Oreggia, 2005). At the same time, a decentralisation process has been undertaken, and local governments have more responsibilities to participate in economic planning, and provision of public infrastructure, education and health. Local governments in Mexico foster investment by means of better economic planning, support to national and foreign firms to ease the paperwork and obtain fiscal benefits, loans and incentives. They may also promote their regions and sign diverse agreements. Besides, municipal government invest on infrastructure. All these actions depend not only on the resources spent, but on the ability and actions of local key actors.

The fiscal and political decentralisation in Mexico has had the aim to allow and encourage the participation from local and regional government to attend their specific needs (Peña-Ahumada, 2011). In other words, federal government seeks to boost the bottom-up approach, given the possible benefits of decreasing regional disparities pointed by various scholars and international organisations such as OECD and CEPAL (Lorens et al., 2002, Enríquez Villacorta, 2006). On the other side, higher decentralisation could also increase jurisdictional competition for resources and reinforce regional inequalities (Sorens, 2012, Chien and Gordon, 2008), especially in developing countries (Im, 2010). Thus, increasing local policies may also lead to regional competition.

In spite of the increasing efforts and pecuniary resources spent by local and regional governments to boost investment, the effects have not been tested yet. The contribution of this chapter is to find whether the expenditures from municipal governments aimed to foster economic growth have influenced the private investment increments. This chapter also helps to fill the lack of information about regional competition strategies in developing countries, as well as about the subsidies revenues for private firms. It is hard to get all the subsidies or incentives granted yet some concrete data is presented here.

In addition, this chapter contributes to the empirical literature of regional competition with a variable to measure the importance of competition policies, relative to close competitors. The literature suggests that regional competition yield upon geographical proximity, economic specialisation, urban amenities and agglomeration economies (Johansson, 2000, Budd and Hirmis, 2004). In view of that, governments should strive to offer better conditions than their closer competitors. Two variables are added to test competition by economic specialisation and geographic location.

Using panel data analysis for 63 cities from 1993 to 2008 it was found that municipal expenditures constitute a significant driver for private investment. With different results, domestic firms tend to benefit more from expenditures on investment fostering, while foreign firms benefit from public infrastructure investment. Competing with infrastructure investment is definitively more important than competition with incentives, regardless the type of competitors assessed. This is geographic or economic competitors.

Given that the expenditure from local governments proved to be significantly enhancing private investment growth, it can be said that decentralisation has endowed local governments to actually pursue economic growth to a good extent. Additionally, their investment showed larger effects over foreign firms, which entails potential opportunities for municipal administrations.

The chapter is organised as follows. The second section discusses about the emergence of competition given the increasing mobile resources in the world, as well as due to the enlarged powers of regions and cities to pursue economic growth and development. The third section presents empirical studies about decentralisation and competition policies effects over private investment. The fourth section tells about the particular policies undertaken in Mexican local administrations and provides information on the total subsidies revenues received by private firms from 1998 to 2008. The fifth section describes the data used for the models, and presents the variables and methodology to be employed. The sixth section presents the models results. And the seventh section brings concluding remarks.

## 2. Emergence of competition for investments

## 2.1 Decentralisation leading to regional competition

Political and fiscal decentralisation has been a leading trend in last three decades given its possible positive effects on regional growth, especially in the OECD countries (Treasury, 2004, Giugale and Webb, 2000). The rising of sub national authorities making bottom-up policies could be a better approach to tackle local matters (Oates and Schwab, 1988). Nevertheless, the effects of decentralisation have been tested and they do not seem positive all times. Different empirical works suggest that fiscal decentralisation is related with the decrease of regional inequalities in developed countries, but not in developing countries (Rodriguez-Pose and Ezcurra, 2010a, Lessmann, 2009, Im, 2010).

It could be due to difference in the institutional framework, lack of administrative capacity at local levels, or corruption increments in local administrations given their major freedom (Im, 2010). Other reason might be losses in aggregate efficiency (Rodríguez-Pose and Ezcurra, 2010). Using data for developed, semi-developed and developing countries, Tobin (2010) found that fiscal decentralisation is positively related with GDP growth in developed countries, but not in semi-developed and developing countries. Sorens (2012) suggest that there should be a compensation program, otherwise decentralisation will exacerbate inequalities.

The higher independence from local and regional governments induces to jurisdictional competition for: 1) public resources, 2) political support from the central government, and 3) for private investments (Sorens, 2012, Markusen, 2007). Such competition might also enhance regional inequalities, given that some cities are in better conditions to compete than others (Cheshire and Magrini, 2009). Still, even if some cities grow faster, depending on the kinds of policies followed, competing to attract investments could cause good results in the long-term.

Whether policies followed enhance regional competitiveness, such strategies will increase growth and wellbeing in the long-term. While if competition is incentives-based, it should boost investment, yet it can lead to short-term effects or even a race to the bottom. An example of the later is when high amounts of money are spent to bring new investments, such that the gains of the new investments may be offset by the grants given (Thomas, 2011). This can be really harmful for local administrations. In spite of it, incentives have been a frequent mean to attract foreign investment in developed and developing countries

(Fisher, 2007). In this way, fiscal and political decentralisation have different potential effects on regional economic growth and income inequalities across regions.

## 2.2 Competing governments and private investment attraction

According to Budd (1998) regional competition is a process parallel to globalisation, but it is actually more concrete. In a context in which capitals and people became more footloose, governments acting in the name of a city/region will attempt to attract mobile resources, frequently by means of specific incentives packages complemented with other kinds of policies (Cheshire and Gordon, 1998, Johansson, 2000).

Governments are the leading actors in regional competition strategies formulation, even though regional competition could also analyse the actions of firms and other private actors (Batey and Frederich, 2000). While their bargaining position however, is also dependant on their available resources, policy guidelines and institutional framework. Yet the attention to the strategic planning will rely on their awareness of the direct competence with other regions at the national or international scale.

There has been a large discussion on the type of policies that could be considered within competition. Some authors consider differently regional competition and competitiveness-increasing policies. While others think that aiming to increase the attractiveness of a region by any mean, is a regional competition policy. After revising different approaches, it is important to mention that in either classification, those strategies aiming to attract and retain investments based on marketing, incentives, promotion, or grants are not sustainable in the long-term, and can be called low-road or *soft* policies. Given that they do not increase the competitive capacity of the region. While other policies strengthening competitive capabilities both with physical or non-physical capital assets, can be called high-road or hard competition policies, and are sustainable in the long-term (Cheshire and Gordon, 1998, Malecki, 2004, Lever, 1999).

Potter (2009) classifies competition policies in two groups: indirect and direct. Among the formers are found namely subsidies, national/regional/local planning, and improvement in the transport infrastructure or other networks for trade. Meanwhile in the later are those which promote spillovers effects between enterprises, such as support for clusters formation, policies of knowledge transfer, innovation and entrepreneurship, since Potter argues that those are the sources of real competitiveness.

Malecki (2004) mentions as low-road policies for instance, marketing, capturing the media attention, for instance those regions that advertise their self as “the best place to invest”, or try to get a good place in competitiveness rankings; competition for tourism by means of improving the cultural scene, such as the architecture, art and history, encouraging diversity in restaurants and shops, which are desirable for both, local and tourist; getting some sports, drinking or eating events; and offering low environment regulations and wages levels. On the high road, are those that encourage innovation, knowledge and spatial spillovers, which to some extent are immobile assets, as the tacit knowledge that cannot be replicated somewhere else.

Indeed, real competition strategies are long-term formulations that must rely on a thorough study of regional capabilities, namely, in which activities they are able to compete; their direct competitors and the organizational resources needed in the long-term, otherwise they become purely good intentions and discourses (Cheshire and Gordon, 1998).

In the case of Mexico and other developing countries, offering incentives helps to compensate some disadvantages against developed countries in terms of infrastructure and well-founded institutions (Harding and Javorcik, 2011). Nevertheless, incentives cannot be a long-term policy since it may generate employment, but no a significant increase on wellbeing and local competitiveness in the long-term (Cheshire and Gordon, 1998, Romer, 1993). On the contrary, it has been also widely discussed that undertaking only low-road/soft policies can lead to the denominated *race to the bottom*. This is, when governments could be incurring in high costs in order to attract investment. It could encompass pecuniary and non-pecuniary costs such as environmental costs, wellbeing of the labour force and fiscal costs.

Regions have to improve their competitiveness level, and local governments should seek to develop linkages between new foreign firms and local firms (Romer, 1993, Cheshire and Gordon, 1998, Malecki, 2004, Greenstone et al., 2010). Indeed, according to Thomas (2003) instead of competing to get investments, governments should try to improve their bargaining position, that is increasing the city attractiveness. Governments should destine their resources to improve local endowments. It will increase the city attractiveness, and private investment will grow owing to the better production conditions, which may amplify their profits, to a larger extend than receiving any kind of incentive.

According to Greenstone et al. (2010) firms consider the local endowments such as the inputs supply, labour force, communications, and transports when evaluating location decisions. However, if they can find similar conditions in more than one city, then the bargaining with local authorities takes place. Thus offering incentives becomes a non-cooperative game in which all have to offer the best they have in order to get the investment, and frequently governments from developing countries or poorer regions pay high amounts of money, which would be traduced on fiscal deficit crisis (Thomas, 2011). In this way, although the local endowments and market size are important drivers for private investment (Cheshire and Carbonaro, 1996), incentives can influence on investment decisions. Not only for foreign investment, but also for domestic investors that receive grants for training, R&D investment, or other inputs.

Despite of the potential problems generated by incentives-based strategies, there have been documented a wide use of such policies in developed and developing countries (Markusen, 2007, Thomas, 2000, Thomas, 2011), leading to fiscal problems, and potentially exacerbating regional income disparities entering into a race to the bottom situation. In the US, Canada and EU competing with grants, incentives and lower taxes has been regulated because it is potentially harmful, and it is considered unfair to compete with other than competitive advantages (Thomas, 2011). In addition, wealthier administrations are usually in possibilities to offer better incentives; this is what could enhance uneven economic performance.

It is also documented that some industries do not invest unless an attractive package of incentives is offered, such as semi-conductors and the automotive, even if they still have to take into account the local/regional features (Thomas, 2011, Geerdink and Stauvermann, 2010, Greenstone et al., 2010). In Mexico, the automotive has been a vehicle to transform the industry. The profile of Mexican industry is no longer a low-technology profile such as maquiladora, but medium and high technology, given the development of the automotive and aerospace (Samford and Gómez, 2012). Therefore, both industries have been subject to large amounts of incentives from the federal government in most places where they are located, rising regional competition given that state governments can also go on their own to bargain with the firms. This is what has been stated with the recent announcement of BMW new plant in San Luis Potosi, in which the governor claims to have gone over 5 years of talks with the company.

In sum, it is widely known that investments are flowing from countries to countries, and even some developing countries are becoming source of investments to other countries. Although their location decisions can be complex and not easily to disentangle, revealed competition indexes, country, regional and local level features are documented to assess places. Additionally to the negotiation held, either with governments or with other entrepreneurs already settled within the industry and even in other industries (Jordaan, 2008). In such context, regardless the competition strategies employed, it is a non-cooperative game which policy-makers cannot neglect (Malecki, 2004, Camagni, 2002), especially in a country such as Mexico with substantial inward foreign investment flows.

### 3. Empirical evidence. Effects of competition strategies and decentralisation on private investment.

As discussed before, decentralisation is not a direct channel to promote investments, yet it could induce competition within countries. In the Mexican case, fiscal and political decentralisation allowed regional governments to pursue better economic performance, which entails different fields of competition. In consequence, the empirical applications do not directly test effects of decentralisation over private investment increases, but on regional disparities. Nevertheless, in the context, it serves as a reference.

Some researchers in Mexico have tested changes in political behaviours at local level given the decentralisation occurred that endowed municipalities and states with more powers to influence on development and economic performance outcomes. Moreno (2013) found that decentralisation has transformed rural governments behaviour to a good extent by fostering accountability and entrepreneurship fashion management. Gonzalez-Rivas (2014) found that given the decentralisation, participation from local citizens find channels to strive for better services. Both studies converge to claim that decentralisation might have induced improvements in governments' behaviours, at the same time that it opened channels for location actions.

Within the empirical applications testing effectiveness of competition strategies, different policies are subject to analysis, namely regional funds, regional infrastructure investments, incentives-based policies, and tax competition. One critic to the empirical applications is that competition is frequently assessed taking expenditures on policies as a reference, though the identification of specific fields of competition is less common. Using the total

expenditures conveys the assumption of generalised competition. Some works have tried to tackle this issue, by finding competitive, complementary relationships between regions in the same country, which are revised later (Márquez and Hewings, 2003, Postiglione and Hewings, 2008). Yet, a more detailed job to find competitive intensity according to economic structure in European regions is presented by Burger et al. (Burger et al., 2013).

The present chapter does not focus on competition intensity, yet on the extent to which the policies aimed to attract investment, have actually achieved that aim, as a public policy assessment exercise. In this exercise the possibility of competition between regions should be also assessed, given that decentralisation endowed municipalities to undertake investment attraction policies. Similar works assessing different types of policies for investment enhancement are listed here as well as the approaches assuming generalised competition across proximate regions.

In their work Harding and Javorcik (2011) tried to determine whether the incentives given to foreign enterprises were effectively attracting new FDI inflows coming out from US enterprises. The data set contains information for 124 countries, developed and undeveloped, from different economic sectors. It comes from a survey undertaken by the authors in a project on the aegis of the World Bank during 2005 and 2006. The work only considered the information from countries where the enterprises receiving the incentives were within an economic activity belonging to a national target, and based on that the government offered subsidies. The target should not be those industries already developed/successful in the country, because in such case the effect of the subsidy on the location could be biased. The increments of FDI inflows could be more influenced for accumulative processes rather than responsive to incentives. The model employed is a first differences model, in order to measure whether the investment promotion produced an increase on the inflows FDI, compared to the last year and not the total or the average through the time. Some control variables are the time to get a construction permit, the cost of doing business and the availability of information in the US from the host country.

The authors concluded that FDI incentives are more effective on developing countries since they have to compensate their asymmetry on information, corruption, and bureaucracy. Incentives appeared to be more effective in countries where English was not the official language, had less effective government, showed higher corruption levels and longer time was required to start a business or to obtain a construction permit. In summary,

those countries actually paid-off for their lack in the institutional framework. In sum, the incentives in fact fostered inward investment.

An interesting work about incentives to domestic firms is the one by Bernini and Pellegrini (2011). They researched on the effects that the state aid on capital accumulation had over the period 1996-2004 in southern Italy. Doing a benchmark between subsidized and non-subsidized firms, it is concluded that in the short-term there is higher growth on output, employment, and fixed assets in the former group, but lower growth in Total Factor Productivity (TFP). In the long-term, given a negative effect on productivity the gains obtained in the short-term are offset. This confirms what was pointed out before by Cheshire and Gordon (1998), Malecki (2004), Romer (1993). In the short-term incentives might increase private investment, foreign and domestic. But in the long-term, regions should strive to increase competitive advantages, that is, to enhance productivity increments. Worse cases had been documented in which the cities are worse off than before the new investment was launched, given the significant amounts of money spent to bring the firm (Rodriguez-Pose and Arbix, 2001, Greenstone et. al. 2010, Thomas, 2011).

Criscuolo et al. (2012) carried out an analysis to assess the effects from the UK program Regional Selective Assistance (RSA) on aided firms. They found that the program had a positive effect on employment, investment, and net entry, but no on Total Factor Productivity TFP.

Marquez and Hewings (2003) analysed level II NUTS (Nomenclature of Territorial Units for Statistics), for the period from 1972 to 1997 in Spain. The work attempted to characterize relations between geographical neighbours. The model employs the regional share of the GDP by each region, and by means of an Error Correction Model and Engle-Granger equation, it is estimated the co-integration vector between each region and its neighbours. When the coefficient showed a negative sign they defined the relationship as competitive and complementary if the sign was positive. That is, it is assumed competition when regions have divergent growth patterns, and complementarily if regions grow together. The limitation of this approach is that the sign of the cointegrating vector of regional GDP shares could not be enough to support competition against all neighbours. There might not be actual economic relation with one or more of the neighbours. And perhaps the reference region is actually more related to cities with similar-complementary specialisation, or in a higher hierarchy. Postiglione and Hewings (2008), studied Italian

regions using NUTS I, NUTS II and NUTS III in order to depict not only horizontal but also vertical relations between regions.

#### 4. Fiscal decentralisation and local competitive actions in Mexico

##### 4.1 Decentralised resources

The resources allocated to municipalities and states are mainly distributed by means of the items 28 and 33, as well as other less important expenditure chapters. Federal government could also transfer some resources directly to municipalities when there is a specific project. Item 33 is tagged and it has to be destined to health, education and public infrastructure in deprived areas. Item 28, is unconditioned, so it can be spent to support firms, provide incentives, and infrastructure.

The allocation criteria for these funds used to be confusing, but they have been clarified and improved through the time. In 2007, the criteria for item 28 changed in order to enhance economic growth and tax collection efficiency. At the state level, before 2007 45.17% was allocated proportional to population. The following 45.17% for improvement in tax collection, those who did better, got more resources. The rest 9.66% was distributed contrary to the other two rules. That is, taking the inverse and giving more to those that had less population and less tax collection, with a compensation aim. According to the federal government, these criteria did not stimulate tax collection efficiency or pursuing regional economic growth, since there were no incentives, nor clear mechanisms to get more funds (Peña-Ahumada, 2011).

The new law in 2007 established that 60% of the funds are distributed according to the GDP per capita growth in each State. The next 30% are distributed according to growth rate of taxes collection over the last three years, in order to reward those that made major collection efforts an increased the quantity, no matter whether the absolute value is high or low. The last 10% is distributed proportionally to the absolute level of taxes collection. In this way, federal government is trying to encourage local administrations to pursue regional economic growth as well as to increase their effort for tax collection. From the total amount received, the states have to distribute at least the 20% to the municipalities. The distribution formula from states to municipalities is different in each state. It mainly relies on two criteria: population and tax collection. Furthermore, there are also other funds

created to increase transfers to those with higher tax collection efficiency and with lower GDP per capita.

Due to the fiscal decentralisation, the total incomes in municipalities have increased in 145% compared to 1993. The resources in local administrations are spent in three main items, current expenditures (53%), Economic fostering and subsidies –EF&S- (15%), and Public infrastructure investment –PIII- (15%). Indeed, the second and third items encompass undertaken actions to boost investment growth. From 1993 to 2010 EF&S has increased 160% and PIII 50%. It confirms the increasing importance of economic planning and incentives at local level. Their actions to pursue economic development and foster investment have had positive effects (Lorens et al., 2002, Rodríguez-Pose and Palavicini-Corona, 2013).

EF&S contains the expenditure on marketing of the city, tourism offices, subsidies and transfers to firms, economic development offices, and some other transfers to local offices for education, health and political parties. Given the availability of the data it is not possible to get to know the shares of these expenditures before 2001. In that year, it is possible to disaggregate the data into transferences, subsidies and other kind of help. The transferences are the most important within this expenditure chapter, with an average of 62% from 2001-2010. This includes all transfers to public offices as mentioned earlier. The following 22% is destined to any other kind of help, which is usually for social expenditure. The final 16% corresponds to subsidies which can be given for consumption, production or transport. This is, not all of these subsidies are pure incentives to firms. In this way, this expenditure item is more related with economic and development fostering than with incentives-based policies. It is important to remark that the subsidies mentioned here are more likely granted to domestic firms, which are those attended at local levels, still some tax exemptions could be given. Yet, the most important incentives come through states and federal governments.

PII comprises all investments exerted at local level on public works and any other investments that are not physical assets, such as investment to increase public security and other planning activities. In this case physical investment has comprised 91% of the total

expenditures from 1990-2010. Those public works could include urban infrastructure, communications, and improvement of basic services, among others.

In sum, Mexican cities have increased their expenditure powers. Still, the changes in distribution criterion seemed to have changed the amounts per capita allocated per city to favour wealthier cities. Compared to 1993, in 2012, cities with GDP above the national average received 20% more funds per capita than those under the average. It might have fostered to maintain or even increase the income differentials across regions, supporting the findings of the researchers reported before.

#### 4.2 Local policies to encourage investment and economic increases

As discussed above different aspects such the initial conditions, transports, roads, general infrastructure, human capital, and access to markets are among the most important drivers for investment growth. Regional strategies, public expenditure, incentives to the private sector, the public services available, and the support to the enterprises might also affect private investor decisions. Together with the gradual abolition of import tariffs, the actions undertaken at local and regional levels to pursue economic success have been increased. Monetary and non-monetary incentives given to new foreign investment increased over the years. According to the Economic Census of INEGI, the revenues from subsidies for foreign firms increased 8 times from 1998 to 2008. In addition, the federal government has different funds to give grants and credit to domestic and foreign firms. Yet, the most important incentives are received by foreign firms, especially in the automotive and the aerospace. In 2011 80% of incentives given by ProMexico (federal office to promote investment) were granted to automotive firms, and the other 20% were firms within aerospace.

In addition, the support to firms have increased and improved. According to the results of the *Doing Business* project from the World Bank, Mexico has improved facilitating the business opening from 57 days in 2006 to 9 in 2013. The support to domestic firms is usually undertaken by local governments, while the states and federal offices attend foreign investors. For local firms the support is to ease paperwork when opening an enterprise. As well as to get incentives or credits available at local, state or federal level. Domestic firms may also receive training on basic administration to improve entrepreneurship. For foreign firms, paperwork, transports, energy, supply chain and

labour force training are the most common needs attended. Also, depending on industry they may be able to get grants, such as the automotive and the aerospace as well as the related industries. In ProMexico, there is also funding for R&D within firms, especially when the universities or students are involved.

In spite of the larger decentralised resources, political decentralisation happened more slowly. Municipalities are still highly dependent on higher administration levels for policymaking and their income. When municipalities propose policies, setting the main tasks to attend during their tenure, generally the higher levels of government, specially the state, also influence on their decisions, and provide important part from the money exerted. In addition, due to the need of coordination and larger resources available in upper levels; municipalities rarely could implement economic policies without the support of the state. For instance, to boost tourism activities, the automotive, the maquiladoras, primary activities, agro-industry, etc., it is frequently required high amounts of resources which are not available at the municipal level. Consequently, the whole project depends on the federal and state financial resources and political support (Costa-I-Font et al., 2003, Samford and Gómez, 2012, Topal, 2013).

In sum, about 30% of the total income at the local level is spent to foster economic growth. The investments to support firms' needs, promote the city, and improve public infrastructure as well as the coordinated actions to increase the support from state and federal government, should have an effect in the private investment that is worth to measure.

### 4.3 Subsidies revenues of firms

Since the expenditure items EF&S and PIII cannot be disaggregated for years previous to 2001, and even so, the information is not specific enough; incentives-based competition cannot be explicitly identified, should there exists. Nevertheless, it is possible to get some data on subsidies revenues perceived by firms, in the Economic Census for 1998, 2003 and 2008. The data is aggregated by municipality up to 4-digit level disaggregation by economic activities, but it is not possible to have access to firm level data. These revenues are total incomes by subsidies, but it does not specify the source of income, this is municipal, state, federal governments, or any other institution.

From there it was found that, foreign firms have considerably increased the subsidies revenues, while there was no real increment for national ones. The total subsidies revenues of foreign firms in 2008 were 21 times larger than in 1998. To some extent, it also regards with the FDI growth. For instance, according to the Secretariat of Economy in 1998, the total FDI –new investment and reinvestment- was 8, 373 USD millions, and by 2008 it was 25, 864 USD millions, which is more than 2 times larger. Yet, the proportion of subsidies revenues over total FDI also increased. In 1998 it was 4%, while in 2008 it was 28%, in other words, in 1998 by \$1 USD dollar investment there were only \$4 cents subsidies, and they increased to \$28 cents in 2008.

As regards with the economic activities supported, in 1998, most of subsidies were received by firms within Transports, storage and mail (46%), Other Services (36%) and Manufactures (10%). That structure changed completely in 2008, when most subsidies were received by Manufactures (61%) and Wholesale trade (36%). The changes in distribution confirm the existence of incentives-based policies to encourage investment of manufacturing firms; specially automotive and related firms. Indeed, 80% of the total subsidies revenues in manufacturing sector, went to automotive firms. It also confirms the statement by Thomas (2011) that automotive firms do not invest unless they receive incentives. The other 20% is concentrated in food industry, textiles, and chemicals. It is also important to remark that firms receiving subsidies are quite concentrated. In 1998 the firms were located in only 12 municipalities, by 2008 it spread out to 38. It does not mean, for instance, that the new investment/re-investment was settled in only 12 municipalities, but only those firms have reported subsidies revenues in the census. It confirms that favouritism is not only towards some economic activities, but it is also geographically discriminatory.

Meanwhile, the total subsidies revenues of national firms had decreased in 39% in 2008, compared to 1998 levels<sup>1</sup>. Among the most important economic activities supported are whole trade, scientific services, and manufactures. In 1998, the distribution was as follows; 19% Financial services, 18% Scientific, professional and technical services, 15% Manufactures, 12% Information in mass media services. In 2008 it was 26% Other services –they mainly include repair services of different nature-, 22% Transport, mail and storage, 22% Insurance and financial services, 10% Manufactures.

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<sup>1</sup> Subsidies given to CFE (Comisión Federal de Electricidad), National electricity supplier are not included.

As for the proportion of subsidies revenues to new investment, in 1998 \$1.00 USD dollar of new investment had corresponded to \$38 MXN cents of subsidies revenues, and by 2008 this proportion diminished to \$35 MXN cents. It is clear that national Manufactures are getting fewer incentives than foreign firms are, which is a constant complain from national industries.

The above paragraphs provide evidence of incentives-based policies, in order to bring some more concrete data to the discussion. As regards with information of incentives given to specific firms, governments should report this when they do it, especially if the firms are recipients from any particular fund. The information presented here is more comprehensive but it does not allow getting to know exact amounts per firm, but just the averages, surely firms are not getting only few Mexican cents by each dollar invested. The incentives are highly concentrated to few cities, and surely to some firms, as shown in the information published in the different registers. For recent years there can be consulted subsidies given by the Secretariat of Economy on their website, together with the recipient names by fund/programme source.

## 5. Data and methodology

### 5.1 Data

The data employed here comes from different databases published by the National Bureau of Statistics (INEGI). For production and firms characteristics the Economic Census by INEGI are going to be used. This is a very rich database at firm level. Given confidentiality problems, firms cannot be analysed as units of study. In this work, the data is aggregated at the municipal level, including 17 economic sub-sectors to account for manufacturing production, trade and services. The activities included are listed in the A.Table 2 of the annex. Given that no information on commodities production is taken into account, the data would frequently correspond to cities' production.

The Economic Census is a survey that is carried out every five years in Mexico. There is information about production, employment, investment, expenditures, taxes, and revenues for domestic and foreign own firms. The Economic Census includes almost all economic activities except for agriculture and livestock activities, which are covered in a separated census. The Economic Census encompasses the whole national territory and includes all firms answering the questionnaire –all firms are asked to do so, but they could refuse to

answer-. Firms without a fixed establishment are not considered. In the case of manufacturing, trade and non-financial services, the survey do not take into account all rural communities, but in some areas chosen randomly. The reason is that these economic activities are rare in small rural communities, therefore the survey is not applied everywhere, such as it is performed with the rest of industries. In this way, this is the data base with the richest information about production of almost all economic sectors, and all type of firms.

Differently to other data bases, Economic Census provides information about the firms that are installed and producing in a specific geographic area, rather than where the headquarters are settled. Depending on the type of firm, different questionnaires are used and this serves also as input for estimating national GDP.

For the censuses after 1998, foreign and domestic firms can be distinguished at the locality level; before, it was only possible at the state level. Thus, when possible, the estimations are divided into domestic and foreign firms, this is for the period 1998-2008. Also the expenditures EFS& and PIII are expected to have different effects on manufacturing firms and all the others, because many policies are intended to support manufacturing firms, specially foreign ones, and public infrastructure is more essential for their productivity. Thus, the models are also estimated separating manufacturing firms and all the others.

## 5.2 Sample

In Mexico, according to INEGI, urban communities are those with more than 2, 500 inhabitants. Given its extended territory and significant rural production, in 2010 from the total 187, 938 localities existing in the country, more than 90% had less than 2, 500 inhabitants. Nevertheless, in that year 78% of the population was living in urban communities and most population lives in medium-size and big cities, which also contributed with the major part of national product. There are 2445 municipalities, each of them is usually composed of several communities, and there are lot of small municipalities that do not have even 50, 000 inhabitants. Therefore, some data is difficult to trace in very small municipalities, as some information can be highly costly to collect, and the population and production considered is small. It is also important to highlight that most data is only available at municipal level.

Additionally, municipal governments which could be making policies to foster economic growth in the sense that has been explained along the chapter will occur more frequently in medium-size and above-size municipalities. The threshold is usually above 80 000/100 000 depending on the classification (Sobrinho, 2003).

Given the government organisation, it is important to remark that the biggest municipality or municipalities in each state will concentrate most of population and production, and therefore it might concentrate most economic policies and resources, this is why it is considered important to include at least one municipality per state, as there are small states with no more than one medium-size city. Under those considerations, this is, the population and production contribution, together with the availability of data, the sample includes all urban municipalities larger than 80, 000 inhabitants by 2005, in order to include at least one municipality in each state.

Among the sample chosen, some municipalities have been established as metropolitan areas given their proximity and interaction with other surrounding urban areas. These metropolitan areas are defined by CONAPO (National Bureau for Population). In total, there are 67 cities bigger than 80, 000 inhabitants, which contributed with about 60% of the national population and 85% of the Total Gross Production<sup>2</sup> (TGP) during the period of study. These 67 cities comprise 365 municipalities, this is, there are many cities composed by more than once municipality; when that is the case, the information for those municipalities in the metropolitan area is aggregated. In this way, the regional unit of analysis are municipalities and cities (metropolitan areas). In all cases, most information is taken from municipal databases, given that it is not possible to disaggregate data at city level in Mexico. Still, as mentioned earlier, production mostly corresponds to urban areas. Hence, the unit of analysis are referred here indistinctively as cities/municipalities, understanding that some entities correspond to one municipality, while other to several.

Mexico City and the cities in the most important oil-producers states -Tabasco and Campeche- are excluded from the sample to diminish bias in the results. Mexico City is a huge economic centre with its own dynamism. The oil producers have big amounts of foreign investment and high GDP per capita, yet its dynamism relies on the natural resources existent rather than in local policies. Many other researchers usually exclude oil

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<sup>2</sup> Total Gross Production including only the 17 economic activities explained above, and specified in the Annex. It does not include mining, agriculture, livestock, electricity generation and oil production.

producers and Mexico City when doing empirical models in Mexico, see for instance (Sanchez-Reaza and Rodriguez-Pose, 2002, Rodriguez-Oreggia, 2005, Rodriguez-Oreggia, 2007, Sobrino, 2003). In sum, the sample accounts for most major cities in Mexico, except those mentioned above. In that way, the sample contributed with about 65% of the national TGP in the period.

### 5.3 The model

The proposed baseline equation is the following:

$$P_{it} = \alpha + \mu_i + \theta_t + \beta X_{it} + EF\&S_{it} + PII_{it} + \varepsilon_{it} \quad (1)$$

Where  $P_{it}$  denotes new private investment with respect to the previous year,  $\mu_i$  stands for the time invariant characteristics of each city, this is city Fixed Effects (FE).  $\theta_t$  is the time dummy.  $X_{it}$  is a vector of control variables for city  $i$  in the year  $t$ .  $EF\&S_{it}$  is one of the interest variables for expenditures on Economic Fostering activities per employee for city  $i$  in the year  $t$ .  $PII_{it}$  is the other interest variable, Public Investment on Infrastructure per employee for city  $i$  in the year  $t$ .  $\varepsilon_{it}$  is the error term. The specification of the variables is done in the following section.

For the estimation method, first, it should be taken into account that given that these are regional units, it is necessary to account for FE in the estimations. Additionally, cities within the same country might be affected by the performance of other cities to a certain extent. It can cause violation of one of the assumptions for panel data models, this is, independence across panels. Also, some external shocks such as the US crisis or macroeconomic policy, which cannot be modelled and can violate independency across panels as well (Driscoll and Kraay, 1998). Cross section correlation can be partially treated introducing time dummies, which is also made in the model to use, yet it entails that correlation for every pair of units are the same (Hoechle, 2007).

Driscoll and Kraay (1998) pointed out that even the modest presence of spatial dependence could cause an important bias in the OLS standard errors, because the orthogonality conditions in the variance matrix are violated. They propose a model assuming a spatial and temporal correlation in the residuals. The degree of dependence between two-cross sectional units depends on the size of the constant factors and their persistence over the time. The covariance matrix is robust to heteroskedasticity.

When proposed, this method was based on asymptotic properties and it was recommended for large samples (Driscoll and Kraay, 1998). Nevertheless, for its implementation in Stata, the method was improved, and proved to work well with small samples, especially for large N and small T panels (Hoechle, 2007); the Monte Carlo simulations were done with even a T=5. The method applies a Newey-West type correction to the sequence of cross-sectional averages of the moment conditions. This allows that the estimator is consistent independently of the size of N.

This estimator is consistent in the presence of heteroskedasticity and autocorrelation as well, still if no cross-section dependence is found, it is recommended to use other estimation methods more ad hoc. There are other methods available in cases of larger panels, especially when N is close to T, such as the estimators based on feasible generalised least squares. However given the shape of this data set -large N and small T- such methods are not appropriated. Also there is the panel-corrected standard errors method that uses pool OLS, which is less convenient in this data set, as no FE approach can be used. The common correlated effects (CCE) method proposed by Chudick, Pesaran and Tosetti (2011) is not feasible for this data set either, given the T available. Moreover, it is more adequate when lagged dependent variables are used, and the data presents autocorrelation; neither case in this data set.

Cross section dependence was tested using the test proposed by De Hoyos and Sarafidis (2006) tests. It was found cross-section dependence, and thus one of the estimation methods to test is one that deals with cross-section dependence. Given the size of the sample, it is believed that Driscoll and Kraay is the best method in this case, additional to the fact that FE can be modelled as well.

Other concern in the data is the possibility of endogeneity of the interest variables. It is possible that the more private investment occurred in one year, the more money exerted on PII and EF&S by the governments; and no the other way around, especially if there are subsidies given. Nonetheless, as said before, for EF&S it is important to remind that the subsidies constitute a small share of the total expenditure item. Also, since the expenditures comprise the budget of public offices they will continue working whether there are more or less investors every year. Still, endogeneity of the variables is going to be tested using difference GMM approach. Additionally, the lags of the interest variables are also used in order to reduce possibility of endogenous variables. Likewise, given the type

of expenditures, it is also likely that the expenditures influence only on future investment decisions that occur months or years after the government has exerted the money. Given the availability of data for public expenditures, it is possible to use up to the 3<sup>rd</sup> lag for all models without losing any observation.

To test endogeneity an IV approach can be used. In order to do it, difference GMM model is going to be used, as it is efficient enough when only right hand variables are believed to be endogenous. It has been suggested by Bond et al (2001) that Systems GMM are more efficient when the time series are persistent. Nevertheless, whether the dependent variable is not lagged, no persistent series are present and there is only presence of endogeneity of right hand variables the Sargan test of Overidentifying restrictions and related tests are enough to assess the validity of the instruments, which can be simply the lags of the instrumented variables (Bond et al., 2001).

#### 5.4 The variables

The dependent variable in the model is the new private investment; the indicator for such variable employed here is the new investment per year, as given in the Economic Census. The investment corresponds to the total investment made by the firm during the previous year –January to December-. For comparison purposes across the censuses, it was found to be the best indicator for private investment.

For some variables the natural logarithm is used in order to find elasticities between the interest variables and the new private investment. The monetary variables are expressed in MXN pesos at constant prices of 2003.

For right hand variables, considering those frequently used in empirical works, the model controls for some regional features such as market size, labour force availability, public infrastructure, health, education, economic structure and economic specialisation degree.

##### *Economic fostering and subsidies (EF&S)*

This variable contains the total expenditures of the municipal government in economic fostering, subsidies and transfers to firms, people and public offices, described above. In order to take into account the size of the municipality, the variable used in the models is the expenditure done per employee in the city. The number of employees is taken into

account, instead of the population, given that this expenditure might be more related to the level of economic activity and employment, rather than just the size of the population. This variable is expected to have a positive effect on the investment levels. It is important to highlight that domestic and foreign firms receive different types of support. Since the municipalities usually support domestic firms, their expenditures might have larger effects in domestic investment increments than in foreign investment.

*Public investment on infrastructure (PII)*

This is the expenditure item to build public infrastructure in the municipalities. Different kinds of infrastructure could be built, such as roads, pavement, drainage, water feeds, etc. This item also contains the non-physical investment which encompasses security and some other expenditure for fostering private investment; this is not well specified in the data. Yet, most of the expenditures regards with physical infrastructure, as explained in the 4.2 section of this chapter. Similarly to the EF&S variable, to take into account the size of the city the variable used in the models is the total expenditure on PII per employee in the city.

*Economic diversity/specialisation*

The spillovers effects from the same or other industries could influence the investment decision of firms (Duranton and Puga, 2000). A way to control for this is to include a variable for economic specialisation. It tells about the presence of few or lot of different industries, therefore the possibility for spillovers intra or inter industry. An absolute indicator is used since the interest is to control for diversity inside the city, regardless to how important is the production of such city in the national scale. The specialisation level is measured according to the size of a specific industry respect to the total TGP in the same city. Therefore, the share of the industry with highest contribution to the city's TGP is used. When the number is high, it can be said that the city is highly specialised and more reliant on one industry. When the number is low the city has more economic diversity. The extreme case would be a city that is specialised to only one industry, the indicator would be 1. On the opposite, if the city is evenly diversified and all industries were equally important, the lowest number would be  $1/17 = 0.0588$ , considering the 17 industries included. Some industries might growth faster in a specialised city due to the intra-industry spillovers. But others could benefit more from inter-industry interactions, and thus grow more in diversified cities (Glaesser et al., 1991).

### *Public Infrastructure stock index<sup>3</sup>*

An index was built using indicators for available infrastructure of electricity, water, roads, communications and drainage system. In empirical research infrastructure indicators vary a lot. Some researchers use the landlines available, or other stock that indicates good availability of services; while others use expenditures (Easterly, 2001). Nonetheless, given the corruption or differences in needs, similar investment levels do not entails similar endowments of infrastructure stock. Thus it is important to add indicators of the stock, when available (Fuentes, 2003, Straub, 2008, Delgado and Alvarez, 2001). AS regards with the expected sign, public infrastructure is positively related to investment increments (Dall'erba and Le Gallo, 2008). However, according to Fuentes (2003), in Mexico not all the cities with relatively better infrastructure endowments are the most successful ones because cities with high economic growth attract more population and firms, making difficult for the local authorities to respond fast to the infrastructure needs, especially in the north. In other words, cities with more dynamic growth might have more infrastructure needs, given the difficulties of adjusting to the demand.

### *Economic Active Population*

As a growth model approach it is useful to control for the labour force availability, which should be positively related to private investment. This is the population over 12 years old in the city.

### *Manufacturing employment*

This is a control variable for economic structure (Alecke et al., 2012), which might also influence the private investment growth rate. Cities specialised in manufacturing activities might be more dynamic than others. On the other side, if the city relies a lot in few industries, it might be very vulnerable to external shocks. The variable is the share of total employees in manufacturing activities over the total employment in the city.

The summary statistics of the variables are included in the following Table 2.1.

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<sup>3</sup> More details about the variables and the estimation method is given in the annex.

**Table 2.1 Variables summary statistics**

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
New private investment. Thousands (MXN)	252	\$1,381,418.0 0	2454620	-\$1,630,061.00	\$20,800,000.00
Economic diversion/specialisation index	252	0.4774761	0.1602751	0.1650831	0.9466147
Economic Active Population	252	452832	482535.5	39348	3185553
Infant mortality rate per 1000 births	252	13.96909	5.56099	2.119626	33.83838
Economic Fostering and subsidies per employee	252	\$140.99	152.24	\$0.00	\$1,082.36
Economic Fostering and subsidies per employee (T-3)	252	\$102.85	134.21	\$0.00	\$1,163.32
Public Physical Investment per employee	252	\$503.14	747.24	\$0.00	\$9,887.51
Public Physical Investment per employee (T-3)	252	\$322.73	324.54	\$0.00	\$2,692.93
Public infrastructure stock index	252	22.11187	6.430653	9.138739	38.75019
Share of manufacturing employment	252	0.2743205	0.1481094	0.0388917	0.6566179
Domestic market potential. Thousands (MXN)	252	\$50,800,000. 00	7.16E+07	\$1,105,058.00	\$515,000,000.00
Total Gross Product. Thousands (MXN)	252	\$45,300,000. 00	7.12E+07	\$289,972.60	\$511,000,000.00
Gcompetition EF&S. Thousands (MXN)	252	-\$0.87	2.67E+00	-\$6.69	\$15.17
Gcompetition PII. Thousands (MXN)	252	-\$0.09	6.33E+00	-\$10.55	\$42.21
Scompetition EF&S. Thousands (MXN)	252	-\$0.30	3.66E+00	-\$6.09	\$31.54
Scompetition PII. Thousands (MXN)	252	\$0.01	8.73E+00	-\$17.39	\$66.07

## 6. Empirical Results

First, there was estimated the baseline equation for all the municipalities form year 1993 to 2008. As mentioned before, when using the whole period it is not possible to split the firms into domestic and foreign, thus, all firms are included. In Table 2.2 the results of the baseline equation are presented using the different estimation methods. In column (1) pooled OLS are reported, FE with White standard errors are in column (2), column (3) presents Driscoll and Kraay, and difference GMM estimator with forward orthogonal transformation is in column (4). All models have been estimated using year dummies.

Pooled OLS tend to be less efficient given the higher number of constraints imposed to the estimation. Standard errors are bigger and coefficients might be biased due to the need of controlling for FE. It can be seen that the pooled OLS results are not consistent with the expected sign of all variables, and showed significant differences in infant mortality rate, market potential and market size variables. Fixed effects model is more consistent, which confirms that it is better to add within FE when addressing regions. Nonetheless, when using FE with Driscoll and Kraay method to address dependence across panels, coefficients and signs remain the same, yet the model is more efficient, thus the standard errors are smaller.

In column (4) with difference GMM method the sign of the variables are the same and the coefficients are slightly lower, which confirms consistency in the model results. In this estimation given the estimation method used, it is expected to reject autocorrelation in first

order, but no in second order. This is confirmed by the tests shown at the end of the table. Hansen statistic indicates that the instruments used for the potential endogenous variables are valid, which used up to the second lag of the variables using collapse option to avoid proliferation of instruments, as it decreases efficiency in the model.

**Table 2.2 Results including all firms, 1993-2008**

Dependent variable: Ln New private investment	(1)	(2)	(3)	(4)
	OLS_base	FE_base	DK_base	gmm_base
Economic diversity/specialisation	-0.3615 (0.3053)	0.1196 (0.5431)	0.1196 (0.2984)	0.1133 (0.5494)
Ln Economic Active Population	-0.0913 (0.1255)	0.5071 (0.4805)	0.5071 (0.6960)	0.5038 (0.4786)
Infant mortality rate	-0.0002 (0.0077)	-0.0110 (0.0115)	-0.0110* (0.0057)	-0.0112 (0.0116)
Ln EF&S per employee	0.0291** (0.0124)	0.0312*** (0.0091)	0.0312*** (0.0084)	0.0338*** (0.0101)
Ln PII per employee	0.1256*** (0.0418)	0.1003*** (0.0251)	0.1003*** (0.0191)	0.0959*** (0.0295)
Public infrastructure stock index	0.0085 (0.0075)	0.0382* (0.0227)	0.0382** (0.0162)	0.0386* (0.0227)
Ln Manufacturing employment share of total employment	-0.1943* (0.1078)	0.1017 (0.2915)	0.1017 (0.1325)	0.1037 (0.2967)
Ln Market potential	0.1642 (0.1353)	2.5498*** (0.7050)	2.5498*** (0.2017)	2.5851*** (0.7018)
Ln of TGP	0.8804*** (0.1443)	-1.9508*** (0.6109)	-1.9508*** (0.2788)	-1.9790*** (0.6081)
Constant	-4.4529*** (0.8702)	-5.1472 (7.4904)	-5.1472 (7.1196)	
Obs	248	248	248	185
N_clust	63	63		63
r2	0.845	0.256		
Instruments				16
Autocorrelation test AR(1) p-value				0.000
Autocorrelation test AR(2) p-value				0.342
Hansen J statistic (overidentification test)				0.356

Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

As explained before, according to Bond et al. (2001) when the endogeneity regards only with right hand variables, this is, the lag of the dependent variable is not present at the right hand variables, and there is no persistent series, the Hansen tests and consistency in coefficients is enough to decide on the validity of the instruments and the model. Particularly, the interest variables that were suspected to be endogenous showed very similar results than FE with Driscoll and Kraay standard errors, it can be concluded that endogeneity is not an issue. Additionally cross section dependence was accepted and when using DK standard errors to deal with it, the model is more efficient. In consequence, it is considered that the best estimation method is DK, which has been chosen as the main method for the rest of estimations.

As said earlier, it could also be expected that the expenditures influence on private investment decisions after some time of the exertion, rather than on the same year. Hence,

using lags of the expenditure variables instead of the contemporaneous data might be more adequate. In consequence, the baseline equation has been re-estimated with the different methods but using the third lag of the interest variables, instead of the contemporaneous data. This is shown in the Table 2.3.

It can be observed that most variables do not change their sign and their coefficients vary slightly compared to the results in table 2.2. However, the sign of PII has changed. It makes sense, since this is investment in public infrastructure, which effects over investment decisions are more likely to be revealed in the mid and long terms. It is worrisome that the effect shows to be negative, while it was expected to have positive influence on private investors.

**Table 2.3 Baseline results including all firms. Using lags of interest variables.**

Dependent variable: Ln New private investment	(1) OLS_base	(2) FE_base	(3) DK_base	(4) gmm_base
Economic diversity/specialisation	-0.4700 (0.2982)	0.0223 (0.5586)	0.0223 (0.3029)	0.0216 (0.5611)
Ln Economic Active Population	-0.1011 (0.1327)	0.1549 (0.4479)	0.1549 (0.6769)	0.1545 (0.4518)
Infant mortality rate	0.0035 (0.0088)	-0.0034 (0.0115)	-0.0034 (0.0053)	-0.0034 (0.0116)
Ln EF&S* (T-3)	0.0517** (0.0237)	0.0404** (0.0198)	0.0404*** (0.0079)	0.0401** (0.0200)
Ln PII* (T-3)	-0.0291 (0.0234)	-0.0592*** (0.0218)	-0.0592*** (0.0089)	-0.0595*** (0.0217)
Public infrastructure stock index	0.0048 (0.0075)	0.0455* (0.0235)	0.0455*** (0.0165)	0.0455* (0.0236)
Ln Manufacturing employment share of total employment	-0.2607** (0.1116)	0.2812 (0.2694)	0.2812 (0.2389)	0.2818 (0.2722)
Ln Market potential	0.1182 (0.1454)	2.7926*** (1.0115)	2.7926*** (0.3045)	2.7935*** (1.0150)
Ln of TGP	0.9475*** (0.1507)	-2.1506** (0.9543)	-2.1506*** (0.3303)	-2.1517** (0.9575)
Constant	-3.8736*** (0.8557)	-0.7309 (6.8992)	-0.7309 (8.2779)	
Obs	248	248	248	185
N_clust	63	63		63
r2	0.832	0.207		
Instruments				16
Autocorrelation test AR(1) p-value				0.000
Autocorrelation test AR(2) p-value				0.847
Hansen J statistic (overidentification test)				0.177

\*Total expenditures per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

As regards with the validity of the models, the results are similar to the previous table. Pooled OLS method seems less efficient than the others, and the sign of variables such as infant mortality rate, market size, and industrial employment share are the opposite, compared to the other methods. Meanwhile, FE with White standard errors, DK and difference GMM estimation results are consistent. The variables' coefficients for FE, DK and difference GMM methods are slightly different, and sometimes the same. The interest variables are very close to the FE results and the Hansen test showed the instruments to be

valid. In view of that, it can be said that endogeneity is not a problem in the models, since very similar results are obtained with the three methods, yet DK is the most efficient. The difference in signs of the variable PII per employee can be identified as the effect over the time or within the mid-term.

In view of this, it is considered more appropriated to use the interest variables with lags. It can be done at no cost of the other data, since these variables are available every year. In other words, taking three years lags do not affect the availability of the other data in the Economic Census. Hence, the number of periods used in the models remained the same.

In these baseline results, is shown that governments' expenditures on PII are slightly more important than those in EF&S. Nevertheless, the former might have negative influence on private investment decisions. This can be related to the type of projects and public works done at the local level in Mexico. Namely, the municipality contribute with public works on parks, drainage, urban roads, water feeds, general cleaning and other local infrastructure that is not directly linked to firms' needs, but with general services and wellbeing. The coefficient indicates that for every 10% increase on PII per employee undertaken in  $t - 3$  year, there has been 0.59% decrease on new private investment with respect to the previous year of the Economic Census. Likewise, for 10% increase on EF&S per employee in  $t - 3$  year, there has been 0.4% increments in new private investment with respect to the previous year.

It has been found that the market potential is the most important driver of investment, and there are decreasing returns to the level of total TGP. This is related to the city size, the larger gross production the smaller rates of new investment. Public stock of infrastructure has been confirmed as a significant driver for private investment, which should have been reinforced by the local expenditures on PII, yet several reasons might explain the opposite sign of the variable. First, it should be taken into account that infrastructure stock regards with the actual assets available in the city, while PII is the expenditure item. As mentioned before, expenditures on infrastructure are frequently an easy source of resources, thus corruption might be involved causing high expenditures but few physical assets (Straub, 2008). In addition, the assets may be more costly in some places than in others given the geography or other natural conditions. Other public infrastructure projects from state and federal government might be more influential for investment decisions.

Given that variable for infrastructure is an index which annual value depend on the other cities endowments, the coefficient is hard to interpret in absolute terms. Still, it is clear that more public infrastructure stock influences positively the new private investment. In this case 10% increase in the index, induced 0.45% increments on private investment during the period 1993-2008.

Infant mortality rate showed the expected sign but it is not statistically significant, neither the rest of the variables, namely Economic Active Population, Economic specialisation index and share of employment on manufacturing activities. Infant mortality rate was statistically significant in the previous results on table 2.2, with a higher coefficient. This might indicate that its true value is larger.

Once it has been established the best method for this panel data, the different variables proposed before are added to the baseline results in the Table 2.4. For comparison purposes the baseline results are in column (1), the competition variables are in columns (2) and (3) and the interaction terms in columns (4) and (5). The additional variables are expressed in levels and not in logarithms. From the results, it is clear that Gcompetition is more important than Scompetition. It means that spending more money in EF&S and PII than geographically close cities can lead to larger growth in private investment. Meanwhile, competing with cities with similar economic specialisation showed less importance. According to the political organisation, within one state, most times political capitals get more political support and financial resources, making that competition within the same state the most important for Mexican cities.

The coefficient for GcompetitionPII is 0.0371 and for GcompetitionEF&S is 0.0417, it means that a sum of \$100.00 MXN is related to approximately 0.37%<sup>4</sup> and 0.42% larger new private investment, respectively. For instance, there are at least 10 cities which had more than \$1, 000.00 MXN in either variable, which could entail influence on private investment to a good extent by this mean. The size of economic specialisation effect is much smaller. The coefficient indicates that a city is spending a total of \$100 MXN more than its close competitors in PII is related to higher new private investment of 0.16%, while Scompetition for EF&S was not significant.

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<sup>4</sup> Since this variable is measured in thousands.

Considering that the yearly growth rates of private investment are also small, the effects of competition should not be neglected, especially if major spending might represent more downstream resources boosting investments, yet it surely cannot be taken as a leading strategic policy.

**Table 2.4 Alternative results including all firms with Driscoll and Kraay method.**

Dependent variable: Ln New private investment	(1) DK_base	(2) Gcomp	(3) Scomp	(4) Ind*EF&S	(5) Ind*PIII
Economic diversity/specialisation	0.0223 (0.3029)	0.3928 (0.4433)	0.1215 (0.3232)	0.0195 (0.3183)	0.2397 (0.3612)
Ln Economic Active Population	0.1549 (0.6769)	0.9018* (0.5030)	0.3870 (0.6889)	0.1791 (0.6860)	0.3406 (0.7030)
Infant mortality rate	-0.0034 (0.0053)	-0.0079 (0.0057)	-0.0046 (0.0054)	-0.0057 (0.0051)	-0.0038 (0.0062)
Ln EF&S (T-3)*	0.0404*** (0.0079)	0.0411*** (0.0071)	0.0362*** (0.0077)	0.0381*** (0.0087)	0.0395*** (0.0069)
Ln PII (T-3)*	-0.0592*** (0.0089)	-0.0577*** (0.0098)	-0.0579*** (0.0076)	-0.0775*** (0.0133)	-0.0479*** (0.0159)
Public infrastructure stock index	0.0455*** (0.0165)	0.0385*** (0.0112)	0.0422*** (0.0139)	0.0426** (0.0168)	0.0400*** (0.0139)
Ln Manufacturing employment share of total employment	0.2812 (0.2389)	0.1966** (0.0931)	0.2999 (0.1818)	0.2076 (0.2215)	0.1354 (0.2161)
Ln Market potential	2.7926*** (0.3045)	2.2445*** (0.3214)	2.4627*** (0.4384)	2.9154*** (0.2878)	2.4800*** (0.3029)
Ln of TGP	-2.1506*** (0.3303)	-1.7081*** (0.2743)	-1.9444*** (0.4509)	-2.2726*** (0.3306)	-1.9000*** (0.3054)
Geographic competition EF&S(T-3)*		0.0417*** (0.0080)			
Geographic competition PIII(T-3)*		0.0371*** (0.0062)			
Competition by economic specialisation EF&S(T-3)*			0.0051 (0.0043)		
Competition by economic specialisation PIII(T-3)*			0.0163*** (0.0048)		
Manufacturing employment share×EF&S(T-3)*				0.0020** (0.0010)	
Manufacturing employment share×PIII(T-3)*					0.0015*** (0.0004)
Constant	-0.7309 (8.2779)	-8.2425 (5.8672)	-1.3840 (8.1417)	-1.0737 (8.1627)	-2.3284 (8.4161)
Obs	248	248	248	248	248

\*Total expenditures per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

The interaction terms in columns (3) and (4) are statistically significant. Nonetheless, manufacturing employment is not significant in any case, the additional effect is very small, and given that the coefficient of the interest variables become a bit smaller when introducing the interaction term; it cannot be concluded that there are actual additional effects of such expenditures according to the level of manufacturing employment in the city.

The following Table 2.5 presents the results for all manufacturing firms –foreign and domestic- from 1993 to 2008. The baseline results in column (1) present various differences with the total results in table 2.4. The interest variables remained with the same sign but smaller coefficients than those for the total firms. In any case, the elasticity is less than 1%. In the base equation in column (1), for 10% increase in EF&S expenditures in the

year  $t - 3$ , there was an increment of 0.32% in new private investment, while for 10% increase of PII in the year  $t - 3$ , there was a decrease of 0.39% in new private investment. It would have been expected that manufacturing firms were more influenced by the EF&S investment, since many cities aim to encourage the manufacturing sector, but the coefficient is about the same. Still, the negative effect of PII is smaller than for the total firms, which indicate that some manufacturing firms might be positively influenced.

Most of the variables sign remained the same, except for Economic diversity/specialisation index. It might indicate different effects of economic diversity on manufacturing firms which, benefiting more from smaller index. This is more diversified economies. Still, the variable is not significant in any case, thus no conclusion can be drawn. The infant mortality rate has a negative sign, its coefficient is larger, and it is statistically significant similarly to the results in table 2.3.

**Table 2.5 Results including only manufacturing firms, 1993-2008, using Driscoll and Kraay method.**

Dependent variable: Ln New private investment	(1)	(2)	(3)	(4)	(5)
	DK_base	Gcomp	Scomp	Ind*EF&S	Ind*PIII
Economic diversity/specialisation	-0.2192 (0.1811)	-0.0056 (0.2855)	-0.1699 (0.1765)	-0.2723 (0.2036)	-0.0001 (0.2391)
Ln Economic Active Population	0.1541 (0.5688)	0.7287 (0.5852)	0.3494 (0.6298)	0.1763 (0.5841)	0.3378 (0.6239)
Infant mortality rate	-0.0120*** (0.0034)	-0.0154*** (0.0031)	-0.0111*** (0.0035)	-0.0138*** (0.0037)	-0.0125*** (0.0036)
Ln EF&S (T-3)*	0.0317* (0.0180)	0.0336* (0.0177)	0.0299* (0.0172)	0.0308 (0.0190)	0.0309* (0.0163)
Ln PII (T-3)*	-0.0392*** (0.0039)	-0.0324*** (0.0055)	-0.0284*** (0.0041)	-0.0505*** (0.0136)	-0.0283*** (0.0076)
Public infrastructure stock index	0.0734** (0.0317)	0.0708** (0.0340)	0.0735** (0.0349)	0.0728** (0.0308)	0.0682* (0.0357)
Ln Manufacturing employment share of total employment	0.9153*** (0.1217)	0.8679*** (0.0267)	0.9318*** (0.0966)	0.8735*** (0.1114)	0.7636*** (0.0930)
Ln Market potential	2.3876*** (0.6092)	1.9416*** (0.5517)	2.0546*** (0.7241)	2.4695*** (0.6400)	2.0805*** (0.5963)
Ln of TGP	-1.6091** (0.6414)	-1.2131** (0.5483)	-1.3516* (0.7456)	-1.6681** (0.6749)	-1.3643** (0.6151)
Geographic competition EF&S(T-3)*		0.0321* (0.0178)			
Geographic competition PIII(T-3)*		0.0283*** (0.0085)			
Competition by economic specialisation EF&S(T-3)*			-0.0086 (0.0075)		
Competition by economic specialisation PIII(T-3)*			0.0141*** (0.0042)		
Manufacturing employment share×EF&S(T-3)*				0.0017 (0.0015)	
Manufacturing employment share×PII(T-3)*					0.0015*** (0.0004)
Constant	-3.5382 (7.2932)	-9.8636 (6.3251)	-4.6820 (7.5923)	-4.2249 (7.4046)	-5.1237 (7.5267)
Obs	246	246	246	246	246

\*Total expenditure per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

There are two findings important to remark. First, the share of the manufacturing employment is significant in these estimations, which is related to the role played by other manufacturing firms in the city, and of course it is also linked to the same firms that are re-

investing in the city. Second, the coefficient of public infrastructure index is about 60% larger for manufacturing firms, which regards with the nature of such firms that benefit more from the available public infrastructure.

For competition variables in columns (2) and (3), similarly to the previous results, spending more than the geographically close cities is more important than spending more than cities with similar economic specialisation. Both coefficients are a bit smaller compared to the total firms, which is also in line with the main interest variables coefficients, since the spending of local governments on EF&S and PII is less important for manufacturing firms than for the total, and therefore the expenditures compared to close potential competitors. According to their coefficients if the sum of the expenditures on EF&S and PII in the year  $(t - 3)$  is \$100.00 MXN higher than the regional competitors the city had 0.32% and 0.28% more new private investment, respectively. As for  $S_{competitionPII}$ , the coefficient indicated that a city spending \$100.00 MXN than cities with similar economic specialisation on year  $(t - 3)$  had 0.14% more private investment.

The models with the interaction terms in columns (4) and (5) showed that, in the case of EF&S, the additional effect given the level of manufacturing employments is not significant, while the interaction term with PII is statistically significant. Considering that the individual effect of the variable PII is negative, the positive sign of the interaction term could indicate that cities with higher shares of manufacturing employment might have lesser negative effects of the total expenditures on PII. Additionally, the individual effect of the variable is bigger from -0.0392 in column (1) to -0.0283 in column (5). The coefficient of the interaction term indicate that, for instance, if a city share of manufacturing employment is 0.5, by every \$10.00 MXN expenditures on PII per employee there is an additional increase of 0.75% of new private investment, which is added to the individual effect. In this case they cannot be added directly given that PII coefficient is presented in natural logarithms.

The following tables present the results for the models divided into domestic and foreign/joint-venture firms, then the period is from 1998 to 2008, as explained before. In Table 2.6, results for all domestic firms are presented, and table 2.7 presents results for all foreign/joint venture firms. In the first column of each group are the baseline results, and then competition and interaction variables are added in the following columns. It should be

taken into account that the period is different, and cities are grouped in a different way, which caused considerable changes in the results, compared to the previous tables.

In Table 2.6 in column (1) the baseline results are considerably different than those found in table 2.3. It could be not only because of the different grouping way, but also because of the period. The interest variables have changed the coefficient sign, indicating different effects of public expenditures across domestic/foreign-joint venture firms. This will be also different when estimating results for manufacturing firms. It seems that in average, the public expenditures on EF&S have had a negative effect over domestic investors' decisions, although the size of the coefficient is small, 10% increase on EF&S per employee in the year ( $t - 3$ ), is related to only 0.21% decrease in new private investment. Still this is worrisome given that most of the attention received by domestic firms comes from municipal governments, and this results indicate that their effort are not encouraging private investment, as they should. The variable PII is not statistically significant. This again indicates little or negative effect of these expenditure items on private investment growth.

The economic diversity/specialisation index has become significant and its coefficient is larger. This means that the higher value, the more rapid growth of private investment. In other words, domestic private investment growth rates are higher when the city is more specialised. The public infrastructure stock index is negatively correlated to the new private investment, as well as the share of manufacturing employment in the city and the total TGP. Infant mortality rate did not show the expected sign. Given that it had the correct sign for total results, and for foreign firms, this could indicate that domestic firms' investment growth is not highly influenced by the local health and wellbeing; while this is more important for foreign investors, as it will be shown later.

In sum, according to these results, domestic firms' investment is positively influenced only by the potential market, the availability of labour force –EAP- and the higher economic specialisation of the cities. Whereas the local public policies to foster private investment, particularly EF&S, might have negative effects over private investment, and the public infrastructure investment –PII- showed null influence.

From those results, it can be expected that the competition variables and the interaction terms have null or little effect over new private investment. In column (2) and (3) only

GcompetitionPII is statistically significant with a coefficient of similar size to the previous results. Nevertheless, given the null effect of this variable on the baseline results, it cannot be asserted that competing by PII would have a great effect over firms' investments.

The interaction terms in columns (4) and (5), only the interaction term with PII is statistically significant. Nevertheless, due to the non-significance of PII, it is not possible to confirm additional effects of public expenditures given certain level of manufacturing employment.

**Table 2.6 Results including only domestic firms 1998-2008, total. Using Driscoll and Kraay method.**

Dependent variable: Ln New private investment	(1) base	(2) Gcomp	(3) Scomp	(4) Ind*EF&S	(5) Ind*PII
Economic diversity/specialisation	0.4949* (0.2670)	0.4473** (0.2140)	0.4070 (0.3130)	0.4591* (0.2448)	0.4649* (0.2616)
Ln Economic Active Population	1.6927*** (0.1059)	1.7516*** (0.0076)	1.8003*** (0.0668)	1.6914*** (0.1266)	1.8301*** (0.0380)
Infant mortality rate	0.0271** (0.0122)	0.0254* (0.0127)	0.0256* (0.0129)	0.0253* (0.0128)	0.0278** (0.0121)
Ln EF&S (T-3)*	-0.0205*** (0.0058)	-0.0181*** (0.0047)	-0.0202*** (0.0047)	-0.0213*** (0.0055)	-0.0164*** (0.0049)
Ln PII (T-3)*	-0.0010 (0.0145)	0.0009 (0.0111)	-0.0056 (0.0134)	-0.0128 (0.0229)	0.0057 (0.0119)
Public infrastructure stock index	-0.0206* (0.0107)	-0.0207** (0.0101)	-0.0216** (0.0102)	-0.0215** (0.0098)	-0.0198* (0.0116)
Ln Manufacturing employment share of total employment	-0.8973*** (0.3113)	-0.8180** (0.3411)	-0.8160** (0.3555)	-0.8951*** (0.3021)	-0.9088*** (0.3157)
Ln Market potential	0.8445*** (0.2058)	0.6822*** (0.1508)	0.8206*** (0.1415)	0.9012*** (0.1599)	0.6956*** (0.1506)
Ln of TGP	-0.7454*** (0.2459)	-0.6292** (0.2623)	-0.7854*** (0.2089)	-0.8028*** (0.1706)	-0.6475** (0.2692)
Geographic competition EF&S(T-3)*		0.0110 (0.0170)			
Geographic competition PII(T-3)*		0.0132* (0.0079)			
Competition by economic specialisation EF&S(T-3)*			0.0080 (0.0079)		
Competition by economic specialisation PII(T-3)*			0.0057 (0.0077)		
Manufacturing employment share×EF&S(T-3)*				0.0012 (0.0014)	
Manufacturing employment share×PII(T-3)*					0.0008* (0.0005)
Constant	-10.5924*** (2.3900)	-10.3551*** (2.1923)	-10.6645*** (2.4120)	-10.5263*** (2.1814)	-11.5509*** (2.9030)
Obs	187	187	187	187	187

\*Total expenditures per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

Now, it is interesting to compare these results with the obtained when estimating models with foreign/joint-venture firms, on Table 2.7. The number of observations is reduced given that there are some cities within the sample in which there are no foreign/joint venture firms. In column (1) it is clear that municipal expenditures on EF&S and PII have had a significant effect over foreign firms, similarly to the total results in table 2.3. It is thus interesting to find that municipal expenditures on EF&S could actually influence positively foreign investment, but no on domestic firms. On the other side, PII expenditures showed a negative sign, and its coefficient is slightly larger than the EF&S. In

this way, by 10% on EF&S and PII, there could be an increment of new private investment for 0.5% and a decrease for 0.53%, respectively.

It was also found that the domestic market potential and the US market potential are the most significant drivers to foreign/joint-venture firms. Infant mortality rate showed a negative sign, yet not statistically significant, neither public infrastructure stock index, and the share of manufacturing employment. This is related to the type of firms mixed here. There are firms within financial services, tourism services and manufacturing. For instance, in case of manufacturing firms public infrastructure index is statistically significant, as it is shown in table 2.9. Meanwhile, it is less essential for tourism and other type of services, especially roads (Dall'erba and Le Gallo, 2008).

**Table 2.7 Results including only foreign and joint-venture firms 1998-2008, total. Using Driscoll and Kraay method.**

Dependent variable: Ln New private investment	(1) base	(2) Gcomp	(3) Scomp	(4) Ind*EF&S	(5) Ind*PII
Economic diversity/specialisation	0.2345 (0.8365)	0.4154 (0.6083)	0.2414 (0.8385)	0.0525 (0.9059)	0.2365 (0.7835)
Ln Economic Active Population	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000* (0.0000)	-0.0000 (0.0000)
Infant mortality rate	-0.0090 (0.0170)	-0.0119 (0.0173)	-0.0092 (0.0176)	-0.0153 (0.0150)	-0.0097 (0.0154)
Ln EF&S(T-3)*	0.0491*** (0.0005)	0.0331*** (0.0040)	0.0462*** (0.0030)	0.0438*** (0.0041)	0.0540*** (0.0015)
Ln PII(T-3)*	-0.0537 (0.0344)	-0.0694** (0.0403)	-0.0703* (0.0370)	-0.1070*** (0.0396)	-0.0348 (0.0412)
Public infrastructure stock index	0.0173 (0.0142)	0.0160 (0.0162)	0.0170 (0.0142)	0.0160 (0.0135)	0.0181 (0.0144)
Ln Manufacturing employment share of total employment	-0.1843 (1.0502)	-0.2153 (1.1233)	-0.1422 (1.0535)	-0.0308 (1.0258)	-0.2525 (1.0437)
Ln Market potential	1.4013*** (0.2385)	1.7101*** (0.1606)	1.4769*** (0.2119)	1.5837*** (0.2117)	1.3413*** (0.2073)
Ln of TGP	-1.6889*** (0.0867)	-2.0454*** (0.0955)	-1.7877*** (0.0804)	-1.9123*** (0.0607)	-1.6617*** (0.0904)
Ln US market potential	0.9475*** (0.2339)	0.9897*** (0.2294)	0.9726*** (0.2641)	1.0131*** (0.2290)	0.9609*** (0.1991)
Geographic competition EF&S(T-3)*		0.1324*** (0.0472)			
Geographic competition PII(T-3)*		0.0111*** (0.0092)			
Competition by economic specialisation EF&S(T-3)*			-0.0589** (0.0156)		
Competition by economic specialisation PII(T-3)*			-0.3541** (0.0043)		
Manufacturing employment share×EF&S(T-3)*				0.0053*** (0.0008)	
Manufacturing employment share×PII(T-3)*					0.0016*** (0.0003)
Obs	183	183	183	183	183

\*Total expenditures per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

The competition variables added in columns (2) and (3) showed that those cities within the same geographic region spending more on EF&S and PII have fostered foreign private investment. According to their coefficients if the sum of the expenditures on EF&S and PII in the year ( $t - 3$ ) is \$100.00 MXN higher than the regional competitors, the city had 1.32% and 0.11% more new private investment, respectively. The size of the effect is in line with the effects of the individual variables, as EF&S has larger and positive effects. In

fact, this result tells that competition can significantly influence foreign investors. On the contrary, investing more than cities with similar economic specialisation did not show a positive influence on private investment.

As said before, geographic competition might be linked to the competition occurred within the same states. At the same time, considering that  $S_{competition}$  is meaningful only for foreign firms, this could indicate a race to the bottom. In other words, that investing much more money than cities with similar economic specialisation has not positively influenced foreign investment as they might respond more importantly to other cities characteristics, or incentives.

The interaction terms in columns (4) and (5) indicate that indeed, municipal expenditures can encourage more investment in cities with larger share of manufacturing employment. Namely, if the share of manufacturing employment is 0.27 –which is the mean of this variable–, then the additional effect of spending \$10.00 MXN per employee in EF&S on year  $(t - 3)$  would increase private investment in 0.41%. Nevertheless, the interpretation of the total effect is not straightforward, since the manufacturing variable itself has a negative sign, and it is not statistically significant. Still, it can be said that municipal expenditures do have additional positive effects on new private investments from foreign/joint ventures depending on the level of manufacturing employment. Even for PII expenditures, since its coefficient is larger in column (5), meaning that its total effect is less negative or it could be even positive.

The last two tables present the results for manufacturing firms, domestic in Table 2.8 and foreign/joint ventures in Table 2.9. For domestic firms on table 2.8 the baseline results in column (1) showed that the expenditures at the local level have had negative effects over private investment, which is opposite to what should be expected, but in line with the previous results for domestic firms. As said before, local governments tend to provide support to domestic firms rather than to foreign ones, and in many cases their efforts are aimed to encourage manufacturing investment. Therefore, finding negative relationship is worrisome, since the policies are not hitting their goals. The coefficients indicate that for 10% increase on EF&S and PII in the  $(t - 3)$  year, there was a decrease of 0.67% and 0.49% in new private investment, respectively.

According to the results, cities with larger share of manufacturing employment have had less private investment growth, which is only true when firms are divided into domestic

and foreign firms. In the case of foreign firms, it seems that higher private investment growth could be positively influenced by the level of manufacturing employment in the city, as shown in table 2.9, while the opposite effect is seen in domestic firms. This might regard with competition. It is frequent that cities with high proportion of manufacturing firms have also wide presence of foreign investors. In such cases, domestic investors might be displaced as found by Aitken and Harrison (1999). Of course if domestic firms become suppliers and there are vertical spillovers, foreign investment may encourage domestic investment in manufacturing and boost productivity. Nevertheless, this is a process that can be very limited, as documented by Contreras et al (2010).

**Table 2.8 Results including only domestic firms 1998-2008, manufacturing. Using Driscoll and Kraay method.**

Dependent variable: Ln New private investment	(1)	(2)	(3)	(4)	(5)
	base	Gcomp	Scomp	Ind*EF&S	Ind*PII
Economic diversity/specialisation	-0.3379 (0.4304)	-0.4151 (0.3702)	-0.3567 (0.4525)	-0.3847 (0.4250)	-0.3866 (0.4025)
Ln Economic Active Population	1.3340** (0.5842)	1.3538** (0.6710)	1.5157* (0.9028)	1.3289** (0.5536)	1.6458** (0.6953)
Infant mortality rate	0.0071 (0.0240)	0.0030 (0.0251)	0.0115 (0.0260)	0.0035 (0.0251)	0.0090 (0.0240)
Ln EF&S (T-3)*	-0.0671*** (0.0149)	-0.0632*** (0.0126)	-0.0616*** (0.0118)	-0.0680*** (0.0136)	-0.0601*** (0.0127)
Ln PII (T-3)*	-0.0481*** (0.0170)	-0.0541** (0.0261)	-0.0302 (0.0188)	-0.0666** (0.0271)	-0.0376*** (0.0135)
Public infrastructure stock index	0.0971*** (0.0260)	0.0965*** (0.0257)	0.1027*** (0.0271)	0.0967*** (0.0262)	0.0997*** (0.0280)
Ln Manufacturing employment share of total employment	-0.7675* (0.3873)	-0.6516* (0.3637)	-0.7486 (0.4968)	-0.7666** (0.3729)	-0.8019* (0.4017)
Ln Market potential	1.3560* (0.7747)	1.0862 (0.7052)	1.1966* (0.7017)	1.4203* (0.7490)	1.0533 (0.6594)
Ln of TGP	-0.2671 (0.6586)	-0.1220 (0.6194)	-0.1232 (0.6394)	-0.3644 (0.6101)	-0.0685 (0.6479)
Geographic competition EF&S(T-3)*		0.0396 (0.0271)			
Geographic competition PII(T-3)*		0.0173*** (0.0039)			
Competition by economic specialisation EF&S(T-3)*			-0.0238 (0.0214)		
Competition by economic specialisation PII(T-3)*			0.0109 (0.0125)		
Manufacturing employment share×EF&S(T-3)*				0.0020** (0.0009)	
Manufacturing employment share×PII(T-3)*					0.0016*** (0.0002)
Constant	-25.7846** (12.1548)	-23.5506* (12.5212)	-27.9951** (11.9801)	-25.1238** (11.5941)	-28.1708** (12.3057)
Obs	178	178	178	178	178

\*Total expenditures per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

Resuming, in the case of domestic manufacturing firms market potential has been identified as the most important driver for investment, to a similar extent than the availability of labour force. It is remarkable that public infrastructure stock has a positive sign, opposite to the results when including all firms on table 2.5. In this way, it can be suspected that local projects of public infrastructure investments tend to be highly inefficient or do not bring immediate benefits for manufacturing firms. Namely, the expenditures do not show any positive influence, while the actual assets are positively linked to private investment. Additionally to inefficiencies or corruption ongoing, local

projects could affect domestic firms if debt is used to undertake such investments, which do not affect foreign firms since they do not need financing support from local governments.

The economic diversity/specialisation index changed its sign as well as the infant mortality rate, yet they are not statistically significant. As regards with competition variables in columns (2) and (3), only  $G_{competitionPII}$  is significant. Even if the effect is positive, it is not enough to overpass the negative effect from the variable PII itself. This indicates, that compared to other close competitors, expenditures on PII might have a smaller negative influence on private investment, but it does not seem to be a likely competition strategy. The size of the coefficient indicates that if the sum of the difference in year  $(t - 3)$  is \$100.00 MXN more than the competitors; the city could have an increment of 0.17% in new private investment.

When adding the interaction terms in columns (4) and (5), both terms are statistically significant. Nevertheless, the expenditures variables  $-EF\&S$  and PII- and the share of manufacturing employment showed a negative effect over private investment. Hence, there might be lesser negative effects of local expenditures over investment with a certain level of manufacturing employment. Still, the total effect could remain negative, due to several possibilities commented before, especially the type of public investments as well as the competition/displacement of firms caused by foreign investors presence if there are not enough vertical or horizontal spillovers.

For foreign firms the results are presented in Table 2.9. In this case some observations are missing since not all the municipalities included in the sample have significant presence of foreign investment and they are dropped from the sample.

It was found that the programs undertaken at the municipal level have had positive and large effects over foreign investment. The  $EF\&S$  coefficient for manufacturing firms is almost 5 times bigger than the coefficient for total foreign firms. As said before, this expenditure item comprises the budget from local offices for economic planning, marketing, tourism, entrepreneurship support, as well as subsidies or local admin-fees/taxes exemptions. In all cases for domestic firms, the expenditure item showed a negative relationship, while it is positive for foreign firms. The coefficient indicates that for 10%

increase in EF&S in the year ( $t - 3$ ) there has been increments in new private investments of 1.9%.

**Table 2.9 Results including only foreign/joint-venture manufacturing firms 1998-2008. Using Driscoll and Kraay method.**

Dependent variable: Ln New private investment	(1) base	(2) Gcomp	(3) Scomp	(4) Ind*EF&S	(5) Ind*PII
Economic diversity/specialisation	0.6083 (0.6708)	0.3906 (0.7624)	0.5615 (0.6760)	0.6002 (0.7050)	0.5730 (0.6365)
Ln Economic Active Population	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000* (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Infant mortality rate	-0.0096 (0.0123)	-0.0102 (0.0110)	-0.0099 (0.0127)	-0.0208** (0.0082)	-0.0095 (0.0122)
Ln EF&S (T-3)*	0.1996*** (0.0384)	0.1914*** (0.0334)	0.1869*** (0.0376)	0.1993*** (0.0440)	0.1983*** (0.0430)
Ln PII (T-3)*	0.0103 (0.0789)	-0.0150 (0.0786)	-0.0097 (0.0791)	-0.0539 (0.0953)	0.0071 (0.0676)
Public infrastructure stock index	0.1051*** (0.0168)	0.1179*** (0.0198)	0.1128*** (0.0174)	0.0958*** (0.0168)	0.1052*** (0.0171)
Ln Manufacturing employment share of total employment	0.5599 (0.7304)	0.5144 (0.7348)	0.5834 (0.7163)	0.6673 (0.7053)	0.5904 (0.8254)
Ln Market potential	-0.9535 (0.6219)	-0.7970 (0.5742)	-0.8717 (0.6464)	-0.7318 (0.6385)	-0.9298 (0.6085)
Ln of TGP	0.0226 (0.5953)	-0.1517 (0.5936)	-0.0976 (0.6346)	-0.2545 (0.6582)	0.0090 (0.6118)
Ln US market potential	1.4898*** (0.3955)	1.4938*** (0.3472)	1.5198*** (0.4129)	1.5754*** (0.3616)	1.4853*** (0.3868)
Geographic competition EF&S(T-3)*		0.0571 (0.0327)			
Geographic competition PII(T-3)*		0.1008 (0.0104)			
Competition by economic specialisation EF&S(T-3)*			0.0682 (0.0148)		
Competition by economic specialisation PII(T-3)*			-0.6307** (0.0050)		
Manufacturing employment share>EF&S(T-3)*				0.0058*** (0.0014)	
Manufacturing employment share>PII(T-3)*					-0.0003 (0.0010)
Obs	162	162	162	162	162

\*Total expenditures per employee in the city  
Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

Expenditures on PII had a positive sign, yet its coefficient is not statistically significant, while, the public infrastructure stock it positive and significant. Once more time, this confirms that the local projects of infrastructure do not positively affect private investment, yet it is essential to improve local infrastructure endowments.

The US market potential is the most important investment driver for manufacturing firms. In case of total firms, the coefficient was smaller given that there are firms in other regions far from the border and some touristic places in which foreign investment do not regard with the US market, or in which the economies of scale are compensated by transport costs. Local market size and domestic market potential are not statistically significant, confirming the central role of US market for manufacturing firms, since domestic market potential is positively correlated to total of firms on table 2.7. It should be also remarked that one of the most important regions for foreign investment is Mexico City and its metropolitan area, which could have biased the sign and coefficient of the variable, since

its investments there are not that related to the geographic position, but it is the most important centre for foreign investors.

As for economic diversity/specialisation, the column (1) could indicate that foreign firms benefit from economic specialisation, yet the coefficient is not significant, and no conclusion can be drawn from there. Infant mortality rate has the expected sign –negative– but it is not statistically significant, neither EAP.

Competition variables in columns (2) and (3) are not statistically significant, except for *ScompetitionPII*. In column (1), the investment in infrastructure –*PII*– did not appear statistically significant. While in column (3), it showed a negative relationship, as well as the competition variable. This confirms that if *PII* have an effect over foreign investors decisions, it may be negative, even when comparing the level of investment to other cities. At the same time, competition with *EF&S* is not statistically significant in any case, even if this showed to have positive influence on investment. In consequence, it can be said that foreign investors may not regard a lot these public investments compared to other cities geographically close, or with similar economic specialisation, but only in absolute terms. In other words, the *EF&S* actually have had a positive effect on new foreign investment, but it does not seem to work as a competition instrument. Indeed, as said before, upper government levels provide the most important incentives packages, which could be taken as incentives-based competition, thus comparing the level of local expenditures on *EF&S* and *PII* between cities do not matter for foreign investors.

Finally on columns (4) and (5) are the interaction terms. The results obtained seem to indicate that *EF&S* could be more effective when the share of manufacturing employment is bigger in the city. Still, the manufacturing employment is not significant by itself, thus the effect is not conclusive.

## 7. Conclusions

In Mexico, empirical works with cities or municipalities are rare, due to the lack of information, as well as the methodological problems when formulating a growth model. Moreover, it is believed that actions on behalf of municipal governments and their expenditures to foster investment has little or null effect, first, due to the three-partnership system, second, because of the few resources available in local administrations. The results showed that local policies matters for private investment increase. In average, for the

period 1993-2008, expenditures on EF&S showed positive effects on private investment, while PII had negative influence.

Nevertheless, when breaking to domestic/foreign total and manufacturing firms, for the period 1998-2008 the results vary a lot. Domestic firms' investment is not positively related to the interest variables. This is crucial to make a call on revising the type of investments undertaken and the way governments are helping local firms. Particularly because most programs run by municipal governments have the aim of encouraging private investment, either by making easier the paperwork, giving support for opening new firms, marketing the place, and all other actions mentioned before that are encompassed within the item EF&S. Additionally, the infrastructure projects, are likely to respond to state government plans, adequate to the needs of foreign investors if existing, or improve basic services to households, which might not directly affect domestic private investor decisions. Still, public infrastructure stock is showed positive correlation with domestic manufacturing firms, which confirms that indeed, increasing public infrastructure endowments is beneficial, at least for this sector, meanwhile PII is not. In consequence, seeking major effectiveness in expenditures for concreting more public works should be the aim. Indeed improving infrastructure is one of the most important parts of competition in the long-term (Budd, 1998, Budd and Hirmis, 2004).

Foreign investors revealed to be benefited from expenditures on EF&S but not from PII. As said in the corresponding section, subsidies in municipal administrations are usually very small. Still, perhaps those cities spending more on EF&S are also participating in coordination with upper government levels to get resources and incentives for foreign firms, in this way, the resources spent on EF&S showed a positive effect, even if the amount is relatively small.

It is clear that the results confirm that decentralisation has endowed local governments to actually pursue economic growth to a good extent by means of fostering private investment. In addition, considering that the distribution criteria are changing to increase equalisation across regions, this might also allow lagged regions to impel private investment.

As regards with competition, the results are quite diverse for every group. These variables showed positive effects particularly in the total foreign/joint-venture firms. While for

domestic firms, it was only significant  $G_{competitionPII}$ . This is a remarkable result; it shows that competition is particularly significant when attracting foreign firms. Those expenditures do not regard with significant incentives, but with local competitiveness enhancement, therefore this competition is not a race to the bottom, which is a positive result. Nevertheless, given the different signs and effects across firms, it is clear that competing by this mean should not be the main strategy, especially because  $S_{competition}$  showed negative correlation in the case of foreign firms. In consequence, cities that intend to compete with other cities in similar economic specialisation might not get positive results, but those competing regionally.

The infrastructure endowments showed a large elasticity with the new private investment, confirming that rather than looking to offer more incentives to the enterprises the best way to make a city more attractive in economic terms, is by means of the infrastructure improvement, as well as the better education and health services that enhance labour force productivity. This is the ground to make a call to increase efforts towards improvements in physical endowments in Mexican cities. Especially, to increase the effectiveness of the expenditures, since they appeared to have the opposite effects, this could be also caused by corruption, regardless of other mismanagements and inefficiencies.

The US market is among the most important drivers for new private investment of foreign/joint-venture firms. Still, given that public infrastructure stock, EF&S expenditures and public infrastructure stock also showed positive influence on foreign investment, investing in such policies could be good to encourage foreign investment. Nonetheless, it should not be neglected that domestic firms should receive more attention to find the reasons behind the negative correlation with municipal expenditures; especially considering that domestic firms are the main targets of municipal administrations.

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## Chapter 3

# The influence of local endowments and regional competition on productivity: Evidence from Mexican cities and states.

### *Abstract*

Mexico has gradually increased fiscal and political decentralisation in favour of municipal and state governments. Many municipal and state governments take advantage of this process in order to foster economic growth. Such actions can be classified as competitive actions, thus the policies are analysed underneath this approach. Among the actual policies implemented, Mexican governments provide different kinds of support to domestic and foreign firms, and also invest in public infrastructure. The actual effects of these expenditures over firms' productivity have not been tested yet. Thus, using panel data analysis at two different disaggregation levels, cities/metropolitan areas and states; the effect of the total expenditures exerted by government administrations over total productivity is tested. The results showed that the policies implemented in municipalities have had little or even negative effects over firms' productivity. Meanwhile, the policies implemented by states have had larger influence on productivity increases. Other regional features such as economic specialisation, infrastructure, market size, US market potential as well as productivity of foreign firms are also essential for productivity growth. In addition, it was found that corruption has a large and negative effect over productivity, however the corruption indexes are only available at state level. Finally, even after the decentralisation undertaken, federal investment proved to be a significant trigger for productivity increases.

### 1. Introduction

One of the most important roles of governments is managing public money to attend the public duties, such as security, health, urbanisation, transport means, economic development, etc. Strictly speaking, all these matters are encompassed within economics in the sense of the Greek root *oikonomia*, which means administration. Nevertheless, economics policies have the specific aim to pursue economic growth, and increase wellbeing and quality of life, which can frequently raise competition at regional/city scale.

It is well established that there is trend towards higher participation of regional and local government on economics policymaking, the called bottom-up approached. Consequently, the influence of territories as determinants of firms' competitiveness, have become an important topic of debate (Kitson et al., 2004). Moreover, the role of competition among cities has been also put forward in the governments' political agenda, understanding the race towards competitiveness as part of regional competition (Kitson et al., 2004).

During the last two decades, municipal (local) and state (regional) governments in Mexico, have increased their role in policymaking. Different strategies to pursue economic growth have been applied around the country, and some have been focused to attract foreign firms, especially in the centre and north-bordering regions. This may have raised/increased regional competition. Nevertheless, given the institutional framework and the relatively small amount of resources available in municipalities and states -comparatively with the federal level- the competition might not be through millionaire bidding wars. Instead, to foster private investment growth, governments compete by building and strengthening competitive advantages.

The effects of the resources spent with those aims have not been assessed yet. However, it is becoming more relevant over the years due to the increasing funds which have incremented at least 4 and 2 times at the local and regional levels respectively. Likewise, the funds available for joint participation with the federal government are also increasing. Therefore, local and regional governments' role has become a potential trigger for economic growth. Given that the policies undertaken may affect firms' productivity, the present chapter seeks to answer this question: have the municipal and state expenditures on economic development and regional competition policies had any influence on firms' productivity?

To address this question a fixed effects model with Driscoll and Kraay (1998) standard errors to deal with cross section dependence, is used. The analysis is carried out at the state and municipal levels separately for the period from 1997 to 2011 and 1998 to 2008, respectively, which defers due to data availability. For municipalities, the models were estimated for national and foreign firms, which in turn were also divided into total and manufacturing firms.

Among the most important results, it was found that municipal expenditures have had little or negative effects on productivity increases of both, national and foreign firms. This might indicate that focused incentives foster firms' inefficiencies. In addition, the investment decisions might be poor, ending up with opposite results to what it is expected.

On the contrary, the funds from state showed positive and greater influence on productivity, which might be due to better/longer-term planning given their longer tenure. Nevertheless, federal physical investment showed larger importance. Consequently, it can be said that in spite of the decentralisation process undertaken in the last three decades, Mexican states and municipalities highly rely on federal policies and expenditures to foster productivity, and therefore achieve higher economic growth.

Other feature such as economic specialisation, domestic/US market potential, and public infrastructure stock have been found highly important for productivity increases. In the case of manufacturing firms, electricity has been identified as an important productivity drawback, as confirmed by (Salgado Banda and Bernal Verdugo, 2011).

This paper also contributes to the literature by bringing on information about the kinds of competitive policies followed in Mexico.

The paper is distributed as follows. In the following section, some literature about regional competition policies and their effects over firms' productivity is discussed. In the third section empirical evidence is presented. The fourth discusses policies undertaken and the resources available in Mexican municipalities and states. The fifth describes the models used. The sixth presents the results and the seventh brings further discussion and conclusions.

## 2. Effects of competition and economic policies on firms' productivity.

### 2.1 Competing regions: Competing governments

Given that territories' endowments may constitute a significant determinant for firms' productivity, competitiveness at the regional and urban scale has been widely discussed, yet criticised. One of the most important critics is that firms face markets, and bad results could lead them to bankruptcy, yet regions will not go bankruptcy (Krugman, 1994). Regions may possibly strive for success, but one region's triumphs do not entail the defeat of the others. Economic performance is not always relative; regions seek for wellbeing on

their own, regardless the results obtained by others. Nevertheless, some features matters when attracting mobile resources. There are regions with similar competitive advantages, which might raise direct competition for mobile firms (Camagni, 2002). Besides, there can be other competition fields, such as public funds allocation, political support or urbanisation economies (Begg, 1999, Johansson, 2000).

Despite of the critics and significant debate, many researchers and policy makers have agreed that regions and cities may compete to attract and retain economic resources, which is generically called regional competition (Camagni, 2002, Kresl and Gappert, 1995, Porter, 2003, Storper, 1997). Therefore, revealed competitiveness of cities and regions has become an essential reference for policy making (Burger et al., 2013). Given the gradual economic integration between countries and transports costs drops, mobile firms have a wider set of options to locate. Besides regional and urban endowments, firms also look for incentives, when available (Greenstone et al., 2010), thus a *moral hazard* problem might be present. For instance, it has been documented that automotive and semiconductors companies do not locate unless they receive a considerable incentive- package, although of course, the local endowments will constitute the most significant part on their location decision (Thomas, 2011, Greenstone et al., 2010).

Due to regional differences in economic specialisation, local endowments and development within the same country, nations have been fragmented into cities and regions when depicting competitive advantages. That is, one may speak about London, Frankfurt, Tokyo, and New York when it comes to financial centres, instead of UK, Germany, Japan and US, in a general way. Therefore, indexes of competitiveness and competitive advantages at city level had been generated in the last 30 years.

The information generated on competitive advantages had been highly appreciated by firms, and competitiveness indexes publication by national or international research agencies have triggered governments' efforts to pursue competitiveness improvement. A clear example is the project undertaken by the World Bank *Doing Business* as a benchmark of institutional differences and their interference when opening an enterprise for a large set of countries. Every year the reforms undertaken by each country are published and compared to previous years. The World Bank assesses whether the reforms actually improve the institutional conditions for doing business or not. This cannot be taken a simple research project, but as a call for governments to undertake policies in pro of doing

business. The OECD has also produced competitiveness indexes for countries and cities, which more than benchmark documents; they are suggestion-policy references. For instance, in the EU the competitiveness/competition measurements are reference points for policy making (Burger et al., 2013, Cheshire and Gordon, 1998).

Nevertheless, it is not correct to compare cities in the way that some competitiveness indexes do. Firms have specific needs, when seeking for potential locations the list becomes quite narrow, that is, not all cities compete against all (Greenstone et al., 2010, Burger et al., 2013). For instance, high technology firms and headquarters are proved to locate in richer areas, while developing countries would attract low and medium technology firms (Burger et al., 2013). Frequently, the latter may offer low wages, low taxes, and attractive incentives sets, even when the firms are low value added, given the importance of employment generation (Malecki, 2004).

Although cities may not compete in the way firms do, governments actually pursue economic development, and the resources destined to this goal may be even excessive (Kitson et al., 2004, Thomas, 2003). Thus, competition and competitiveness are ever more important as regional policy drivers (Burger et al., 2013). More importantly, competition does not seek economic equality, but it may encourage regional inequalities; that is richer regions may have better conditions to pursue economic growth.

## 2.2 The concept of regional competition

Some definitions of territorial competition are stated to clearly set the framework for policies assessment in this work. The concept is problematic to some extent. The line between regional competition and regional/urban competitiveness concepts is still blurred, and sometimes they are considered the same (Kitson et al., 2004, Lever and Turok, 1999). The concept by Cheshire and Gordon (1998) has been widely accepted, since it states a difference between competition and competitiveness itself. They state that territorial competition is ‘a process through which groups, acting on behalf of a regional or sub regional economy (typically a city-region), seek to promote it as a location for economic activity either implicitly or explicitly in competition with other areas’ (p.385). Indeed, it is clear that, agents representing regions are competing -not regions- especially public officers in democratic countries seeking for votes (Kresl and Gappert, 1995, Malecki, 2004, Turok, 2004).

However, it should be remarked that also private actors could participate in competition policies design (Johansson, 2000). In addition, the quality of life, and living standard as goals should be also added to the territorial competition concept. An example is the definition by Poot (2000), who defined territorial competition as ‘the actions of economics agents that are taken to enhance the standard of living in their own territories, such as regions, cities or countries’ (p.205).

### 2.3 Regional competition strategies and their influence on firms’ productivity

Regional competition strategies could be classified into two groups: hard and soft. The *hard* strategies are those aimed to improve the competitiveness determinants that may help to increase firms’ productivity directly, that is, policies enhancing competitive capabilities (Kitson et al., 2004, Malecki, 2004, Cheshire, 1999). The *soft* strategies regards to promote the region by means of marketing, and specially by giving grants, special concessions, gifts and tax exemptions to firms in order to encourage their location or re-investment; in other words, incentives-based strategies. This is the so-called race to the bottom, since it could be a zero-sum game from the regional point of view (Cheshire and Gordon, 1998) and even a negative-sum game when one region benefits may not offset the losses from others (Thomas, 2011, Rodriguez-Pose and Arbix, 2001). In Table 3.10 is presented a brief classification of territorial competition policies.

**Table 3.10 Territorial competition policies classification**

Zero-sum ( <i>soft</i> )	Growth Enhancing ( <i>hard</i> )	Network Enhancing ( <i>hard</i> )
Pure promotion	Training	Internal networking
Capturing mobile investment	Fostering entrepreneurship	External (non-local) networks
Investment subsidies	Helping new firms	Benchmarking assessments
Subsidized premises	Business advice	Airline and air freight links
	Uncertainty reduction	Scanning globally for new knowledge
	Coordination	
	Infrastructure investment	

Source: the first two columns belongs to Cheshire and Gordon (1998) and the third one to Malecki (2004).

#### 2.3.1 Incentives-based strategies

The incentives-based strategies have been regulated given the numerous cases in which high amounts of incentives were offered to firms around Europe and the US (Thomas,

2003, Markusen, 2007). Furthermore, this encourages regional inequalities, since richer regions have more money to offer grants, which put them in an advantageous position. More importantly, wealthy regions could also give away grants to foster location of firms that would have located there anyway, given their local endowments, and other regional features. As regards with poorer areas, they might opt for exemptions more than cash grants (Thomas, 2011). For instance, in Mexican municipalities, it is more common to grant tax exemptions rather than cash grants, given the scarcer funds; cash grants frequently comes through the federal government.

Beyond the possibility of encouraging regional income disparities, one essential critic for incentive-based strategies is that they could support inefficiency; they would keep on the market firms that might not be profitable without the incentives (Thomas, 2003). Moreover, firms may even change their production technology in order to take advantage of incentives, which could prevent productivity optimisation. For instance, Blonigen and Kolpin (2007), cites the example of Mercedes-Benz automotive that located in Alabama in the 90's, and given the low qualification of labour force, they had to change their production technology by becoming less capital intensive.

Incentives and exemptions may lower the public resources available to attend other areas; therefore high expenditures in these matters may worsen the general production conditions, specially public services and infrastructure in detriment of firms' productivity (Dabla-Norris et al., 2011).

Incentives from local and state governments could also lead to debt problems or excessive grants to win over firms. For instance, there is the case of ThyssenKrupp's which was settled in Alabama in 2007 (Thomas, 2011), pp.50). The firm received \$734 USD million incentives and created 2700 jobs, in other words, it received around \$271, 963 USD per job. To choose the location there was a tournament; after a discrimination process, there were two competitors left, Alabama and Louisiana. The incentives packages from both states were so large that they had to increase their debt limit. Besides, both states incurred in expenditures during the lobbying; therefore, there were losses for Louisiana.

When acquiring high debt, government compete against firms for the available funds in the economy, making the credits more expensive, and therefore, fewer profitable projects (Dabla-Norris et al., 2011). In Mexico municipal and state governments have recently

increased their public debt, competing for credit with the private sector, which may constitute a restraint to firms for credit access. Additionally, the debt is frequently used to finance part of the current expenditures, which may be an indicator of bad local management and organisational skills by itself (Correa Gomes et al., 2013).

In the short-term, in case of developing countries and less developed regions within developed economies, incentives-based policies should be implemented with compensation aims, to reactivate regions in crisis, or to balance competitive weaknesses (Romer, 1993). Incentives aimed to reactivate lagged regions or to compensate poorer areas in the European have shown positive effects over employment; private investment, and GDP growth, yet, productivity had not been boosted (Alecke et al., 2012, Criscuolo et al., 2012, Schalk and Untiedt, 2000, Bernini and Pellegrini, 2011, Devereux et al., 2007).

According to Harding and Javorcik (2011) targeted promotion (incentives-based) is more likely to work in countries with issues such as lack of good institutions, corruption, insecurity, crime, low qualifications of labour force, etc. Thus incentives-based strategies may lead to higher foreign investment and local GDP growth (Jordaan and Rodriguez-Oreggia, 2012), but productivity increments in developing countries are less certain (Aitken and Harrison, 1999). Empirical studies at this regard are going to be depicted in the corresponding section.

### 2.3.2 Strategies enhancing competitive capabilities

These strategies could address topics on public infrastructure, local amenities, I+D investment programs, entrepreneurship training, improvements on labour force skills, as well as networking enhancing. This last one has been particularly discussed because by enhancing local networks, *tacit* knowledge would be generated and firms would get attached to one place owing to specific characteristics that cannot be replicated somewhere else, leading to a better competitive position (Malecki, 2004, Capello and Camagni, 2005). This strategies are usually identified within competitiveness literature as determinants or drivers of competitiveness in the mid and long-terms (Boshma, 2004, Turok, 2004).

In fact, governments usually combine both kinds of policies, that is, *hard* and *soft* strategies. Given the scarce resources, governments should target the activities to foster in order to make an efficient use of resources, and encourage specialisation, which is actually a competition strategy (Kresl and Gappert, 1995, Begg, 2002, Camagni, 2002). They can

also choose economic activities that are more desirable in terms of value added, employment created, and benefits for the firms located there (Cheshire and Gordon, 1998). Nonetheless, in the long-term they should combine incentive-based strategies with the construction of competitive advantages that actually improve production conditions for foreign as well as for national firms (Cheshire and Gordon, 1998).

The strategies to be analysed are mixed. A large proportion of the resources are dedicated to public infrastructure, which is positively related to increments in labour force and aggregate firms' productivity, as well as increasing economies of scope (Dabla-Norris et al., 2011). These effects might be diminished due to inefficiencies of public investment, as well as corruption and funds diversion in developing countries (Straub, 2008). In Mexico infrastructure has been found as a significant driver for GDP growth (Rodriguez-Oreggia, 2007) and convergence (Rodriguez-Oreggia, 2005). Yet in case of productivity, empirical models the relationship with infrastructure can be contradictory, since the places with better public infrastructure are not always the most productive ones (Fuentes, 2003).

### 3. Empirical evidence

Within the empirical works, just few test the effects of competition policies with firm data, while most researchers work at the regional level. Among the former, using information for southern Italy, Bernini and Pellegrini (2011) researched on the effects that the state aid on capital accumulation had over the period 1996-2004. They chose a control group to find performance differences between subsidized and non-subsidized firms. They conclude that in the short-term there is higher growth on output, employment, and fixed assets in the former group, but lower growth in Total Factor Productivity (TFP). Therefore, in the long-term given a negative effect on productivity, -main competitiveness determinant-, the short-term effects seem to be offset owing to those losses.

Similar results are found by Criscuolo et al. (2012) when assessing the effects from the UK program Regional Selective Assistance (RSA) on aided firms. They found that the program had a positive effect on employment, investment, and net entry, but no on TFP. The program was effective in small firms and even though is a targeted aid program; they found that the "cost per job" creation was low, \$6,300.

Among the works assessing effects of regional funds is Schalk and Utiedt (2000), which evaluated the effects of regional funds in Germany for the period 1978-1989. These funds

include not only incentives to productive projects, like the above works, but also investments on public infrastructure, similarly to the approach of the present document. Using a neoclassical approach, they found a positive effect on private investment and employment in the manufacturing sector. However, they did not find evidence of convergence on labour productivity, neither on GDP growth.

According to Alecke et al. (2012), most studies in Germany fail to account for spatial dependence which could significantly bias the results. Therefore, they also test the influence of regional funds (program called GRW) on regional productivity growth for a different period, from 1994 to 2006. Differently to Schalk and Utiedt (2000), Alecke et al. used panel data analysis and then a spatial weight matrix was added to account for the effects of spatial interaction/dependencies. The results showed conditional convergence and a positive relationship between funds allocated and labour productivity growth, measured by GDP per worker.

As mentioned before, the competition strategies aimed to attract more foreign firms also have a potential effect over aggregate productivity by this mean. Nevertheless, there is a debate in the literature whether spillovers may occur, and the way they would (Aitken and Harrison, 1999). In Mexico, as well as in other developing countries, foreign investment is fostered given the possibilities of GDP growth, boosting labour force skills, technology transfers, employment growth, and higher wages, among others benefits. Without doubt, the automotive and aerospace industries have brought many of these benefits to Mexico (Jordaan and Rodriguez-Oreggia, 2012, Jordaan, 2011).

It has been proved the existence of vertical backwards spillovers, but negative horizontal spillovers (Jordaan, 2008a, Jordaan, 2011). In other words, there have been confirmed spillovers intra industries to the suppliers of foreign firms, in which given the technology difference, Mexican firms can massively benefit of these interactions. Meanwhile firms within the same sector have experienced negative spillovers, as expected according to some researchers (Smarzynska Javorcik, 2004). From a wider view, FDI constitute a significant driver for GDP growth, especially in the manufacturing sector (Jordaan and Rodriguez-Oreggia, 2012). Most studies on FDI have focussed in the manufacturing sector, one reason is that most investments flows to manufacturing firms, other is the larger information availability. Yet there are also lot of participation in retail-trade, finance, real-state business, and tourism services, areas in which competition have also displaced firms,

while in some cases could have fostered higher efficiency (Topal, 2013, Smarzynska Javorcik, 2004). This work also tests foreign firms' productivity effect on the aggregate productivity of cities as a whole.

Aitken and Harrison (1999) tested the effects of FDI presence over productivity of domestic and joint-venture firms. The results suggest that FDI negatively affected the productivity of domestic plants. The gains from FDI seemed to be entirely captured by joint ventures. Thus, indirectly, policies aimed to attract FDI might affect negatively the productivity of domestic firms.

#### 4. Local and regional competition policies in Mexico

##### 4.1 The local and regional budgets

The taxes revenues in states are small compared to the total incomes. The proportion of tax revenues over total incomes was between 2% and 3% for 1989 to 2011; while the average in municipalities was 16% for the same period. Due to the fiscal agreement, some taxes could be collected in states and sent directly to the federal administration. It will devolve and redistribute the resources by means of diverse federal funds, mainly items 28 and 33. These in turn will be also re-distributed to municipalities.

Compared to 1993, by 2011 municipal and state governments experienced an income increase up to 1.5 and 2 times, respectively. This is shown in the Figure 3.1 where the total income levels of municipalities and states from 1993 to 2011 are plotted in the left axis, while the percentage growth in on the right axis. In 1993 states and municipalities budgets together, compared to the federal budget, used to represent less than 35% of the later, while by 2011 the proportion increased to 55%.

Consequently, although municipal and state governments have greater limitations, the effectiveness of their expenditures and policies implemented has enlarged over the years. Also, given the co-partnership work, expenditures exertion and planning is essential and could make a difference to get positive effects out of decentralisation in Mexico (Moreno, 2013).

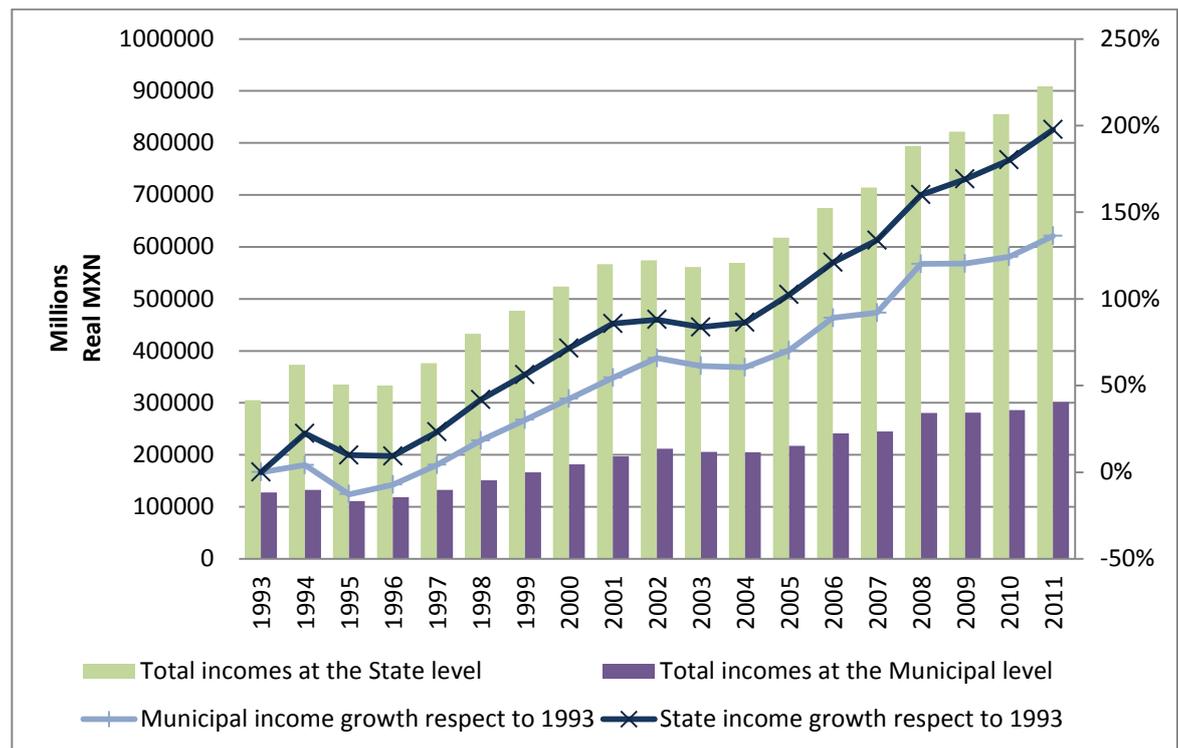


Figure 3.1 Left axis. Total income in real mxn pesos. Right axis. Annual growth with respect to 1993 income.

Fiscal decentralisation entails the increment of mainly two transfer funds, item 28 and item 33. From the increasing incomes, some are labelled, and cannot be freely exerted by state and municipal administrations, or they might be subject to national priorities.

Item 33 delivers labelled resources to be exerted on health and education principally, tasks that used to be managed from the federal level, and were decentralised during the term in office of Mr. Ernesto Zedillo, as one of the most significant decentralisations reforms (Courchene and Díaz-Cayeros, 2000). Item 33 also includes resources for public safety, poverty alleviation, infrastructure and institutional improvements. The later theme includes the resources aimed to do planning and organisational improvements. For instance, when opening a new business entrepreneurs need to do paperwork with different public offices at municipal, state and/or federal levels, which can take long time. Some administrations endeavour continuously to achieve *the one stop shop* by coordinating with upper levels and hiring public consultants to help firms with paperwork and allow to complete the process by means of the municipality, saving time as well as steps<sup>5</sup>. Other institutional improvements such as monitoring the goals achieved by programs implemented could be

<sup>5</sup> Public consultants at the municipal level in Hermosillo commented about these reforms in the country, and the World Bank documents them. Doing business reforms, Mexico.

<http://www.doingbusiness.org/reforms/overview/economy/mexico>

also included here, which has the aim of increasing the effectiveness of the public expending.

## 4.2 Resources and means for undertaking regional competition and economic policies

### 4.2.1 Co-Partnership funds

States government departments are frequently the mediators to access funds when there are foreign firms, while municipal administrations attend to national and/or smaller projects. For most funds, there needs to be coordination from the three levels, which is also stated in the operating criteria of the funds.

Whether foreign firms want to access federal incentives, they could also directly go to federal instances such as ProMexico and the Secretariat of Economy on their regional branches, depending on the fund they want to access. There are funds with specific targets, that is, they give the grant when firms are willing to improve logistics (PROLOGYCA), to undertake innovation projects (FINNOVA, CONACYT), to decrease greenhouse gas emissions (FINNOVA), among others.

Some programs from federal government are aimed to attend mostly rural and marginalised areas in order to foster self-employment (PRONAFI, FOMMUR, FONAES). There are other funds intended to encourage software development, innovation, or firms' investment growth (PROIND, FINNOVA, PRODIAT, COMPITE, among others). Most of funds would finance partially the total cost of the new investment to be exerted and additional to the federal financing, local or regional government could provide more financial support, or other kind of aid. For instance, during 2011, FOMMUR granted 74 USD millions to 14,936 recipients, and only about 20% was contributed by federal government.

Due to unemployment problems, after 2000 the federal government have considerably increased the number of projects and funds to provide credits for SME's (Small and Medium Enterprises). They operate through different channels, coordinating efforts either with entrepreneurs' chambers, or with municipal and state's economics departments. Among the conditions to access credits or grants, small firms should take some training, and formulate the investment project. Thus, municipal and state economic departments provide consultancy in order to fulfil the paper work, but also to increase the probability of

firms' survival by advising on marketing and administration matters. There could be also micro-financing offices or enterprises that could borrow credits from federal government to give loans to SME's, which is a third channel to administrate credits.

Finally, it is also important to remark that due to the priority given to automotive and aerospace by federal government, firms within these-and related industries have received major attention on behalf of ProMexico. For instance in 2011, 80% of incentives were granted to automotive firms, and the other 20% were firms within aerospace industry.

#### 4.2.2 States and municipalities

Although the total expenditures from both, local and regional governments, are much less than the federal budget, about the half in 2011, local and regional economic development policies may have had a significant effect over firms' productivity. The channels are manifold, first, directly through investments and local policies. Second, indirectly, due to three-partnership programs and proactivity to make better planning and lobbying for resources. Resources are more easily obtained if they are aimed to deprived areas, or to build basic infrastructure. For instance, urbanisation works such as streets paving, public gardens construction, and sewage works; transport means/roads. Other way is to follow federal policies guidelines on economic development policies, such as investment attraction policies, marketing touristic areas, developing "Pueblos Mágicos<sup>6</sup>", delivering training for local entrepreneurs, and getting credit or funds for local or foreign firms.

Given the fiscal system in Mexico, the possibilities to undertake tax competition are very limited. At the municipal level just exemptions on land-property taxes and construction permissions are the most frequent tax-incentives, since land property is the most important tax paid to the local administrations by firms settling. Indeed land-property tax and water payments are the most important from own incomes at this level (Peña-Ahumada, 2011).

Likewise, states do not set lots of state-taxes, yet they may still provide exemptions on some registration fees when opening new firms, on vehicle ownership-tax for firms, or taxes on real estate properties. It varies according to the state. The full list can be checked

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<sup>6</sup> Pueblos Mágicos is a program started in 2001 by the Secretariat of Tourism (SECTUR) in order to increase and promote the appraisal of typical towns in Mexico, and provide an alternative source of income for their inhabitants.

in the website of ProMexico , which is the promotion and marketing office for foreign investment at the federal level.

All programs and actions to foster investment and improve production conditions are difficult to monitor. Yet, from the local and state administrations most of the resources spent on tax exemptions, grants, incentives, entrepreneurship training, and investment promotion are registered in one expenditure chapter that is going to be called Economic Fostering and Subsidies (EF&S), from here onwards. This item might also include expenditures on education, health, and political parties, as well as tourism and economics departments' budgets. Given that the item cannot be disaggregated<sup>7</sup>, the total sum is used in the analysis. In other words, it comprises most expenditure on territorial competition policies.

In addition, municipalities and states also undertake infrastructure investment which is registered in a different spending chapter. It also encompasses other types of non-physical<sup>8</sup> investments. This non-physical investment may also include other resources spent to pursue economic development given that INEGI states that non-physical investment is the one aimed to increase inhabitants' wellbeing such as public security, economic or institutional development). However, given that the physical investments, that is, public works on infrastructure, constitute the major proportion of this expenditure chapter, it is called Public Infrastructure Investment (PII) from here onwards. Given that these two spending chapters -EF&S and PII- register the resources exerted to foster economic development and competition policies - at both municipal and state scales- they are the main interest variables to estimate policies' effects.

The total expenditures in these two items have increased considerably. At the municipal level the total growth of EF&S for the period, 1993-2011, is 207% while PII 122%. For states, the total growth is 434% and 52%, respectively. Given that states exert bigger proportions of decentralised expenditures on health and on education, the growth of EF&S is much larger for states. Nevertheless, the resources spent to foster economic growth are still highly centralised. In 1993 the resources from federal government on similar expenditure chapters were 6 times larger than the sum of municipal and state governments,

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<sup>7</sup> In the last years, it can be disaggregated, but not for most of the period of study.

<sup>8</sup> INEGI states that as non-physical investment is that aimed to increase inhabitants wellbeing such as public security, economic or institutional development.

yet the difference decreased by 2011, when federal budget was 3.7 times the budget of Local and state budgets.

In this way, the higher participation from municipal and state governments has become ever more essential to foster economic growth. More importantly they constitute key actors to support national firms, easing doing business. Indeed, from 2011, INEGI started running a survey with municipal and state governments in order to evaluate their institutional management. Among other things, they search whether the institutions are evaluating budget implementation and the results obtained afterwards. They assess to what extent the institutions have worked based on general plans and if they evaluate the compliance of those plans. This new practice confirms the higher interest on local and regional governments' management, given their increasing role for economic policies. In fact, the work from Rodríguez-Pose and Palavicini-Corona (2013) did something similar, by asking to more than 800 local governments whether they undertake planning and LED (Local Economic Development) policies. The results showed that governments applying LED policies actually influenced on the improvement of human development.

In sum, Mexican governments do not undertake bidding wars, or purely incentives-based competition policies to attract foreign firms because federal government usually gives the pecuniary incentives, which indeed may highly bias the location decisions from foreign firms beyond local endowments and economic policies.

The subsidies revenues obtained by firms has increased in recent years, yet they are still low, compared to the total investment existing. According to the registers of the Economic Census, by 2008 for every dollar of new investment in foreign-own/joint-venture firms they had \$18 cents subsidies revenues. While Mexican firms in total had received \$34 cents. In average the amounts are small, yet they are distributed among very few firms, especially in the case of foreign. In addition, this proportion has been enlarged for foreign firms, while it has diminished for domestic. Compared to 1998, subsidies to Mexican firms decreased 11%, while for foreign firms increased in about 30 times.

Municipal and state policy-makers would mostly play hard competition strategies while undertaking incentives-based policies to a lesser extent frequently highly coordinated with the federal government. In consequence, local and regional governments should strive to pursue competitive advantages, if they want to become more attractive for foreign firms

and encourage national firms' growth. Especially, they must play a managerial role to take advantage from the federal funds available. In addition, when attending foreign firms, beyond incentives, policy makers need to attend their needs and create the conditions for their settlement, which usually regards with networking to supplier chain, ensuring local services and easing paper work.

## 5. Empirical application

### 5.1 Sample

The smallest unit of public administration in Mexico is the municipality. However, as explained before, they are subordinated to the state level. Consequently, two scale of analyses are used here, that is, state and municipal. There are 2457 municipalities in Mexico, yet, such as in the previous chapter in order to include only medium size to big urban municipalities the sample includes those with more than 80, 000 inhabitants in 2005.

Given the geographic proximity and economic interaction of some municipalities, the National Council of Population (CONAPO) have defined Metropolitan Areas (MA). Therefore, when the municipality is part of a MA, all the municipalities are included together as a unique regional unit. In total there are 43 MA and 24 municipalities with more than 80, 000 inhabitants. They contributed with an average of 60% of national population in the period of study, and 85% of TGP.

Mexico City, Tabasco and Campeche are excluded from the model, given that they might be outliers. Mexico City has a different dynamic and economic pattern since historically it has constituted the main economic centre in Mexico. Its economies of scale and scope may not rely only on local governments policies during the period of study. Tabasco and Campeche are the main oil producers; consequently, they receive considerably more federal transfers than the other states. Many researchers do the same when studying Mexican regions (Rodriguez-Oreggia and Rodriguez-Pose, 2004, Rodriguez-Oreggia, 2005, Sanchez-Reaza and Rodriguez-Pose, 2002). Hence, there are 42 MA and 21 urban municipalities in the sample, that is, 63 regional units, which contributed with 65% of national TGP. In this way the sample represents the majority of national GDP and they are the most important decision centres, where the existence of competition and economic development policies are more likely to exist, except for Mexico City.

It is important to remark that MA do not have a unique municipal president, but they might cooperate to provide some public services, to do planning and to encourage economic growth. According to the Mexican Constitution, Art. 125, when there is geographical proximity or the municipalities are too small, they should strive to coordinate with the neighbouring municipalities. This is especially the case for the centre region, where many municipalities are very close or even together geographically.

It should be also highlighted that Mexican municipalities can comprise more than one urban locality<sup>9</sup> and rural areas. Yet in all the municipalities within the sample the main urban centre concentrates most of population and production, at least 70% from the whole municipality. Therefore, given that agricultural and mining production are not included in the analysis, neither any other commodity production; the data used is assumed to represent cities' production, in either municipalities or MA. More specifically, firms included perform services, trade and manufacturing activities.

## 5.2 Data

Most of data used in this work comes from INEGI and CONAPO databases. If a different source is employed it is going to be stated. In Mexico, there is no information for municipalities' production for consecutive years, but for every 5 years from 1989 onwards. Still the Economic Census from 1989 is difficult to match with newer data, and it is not within the interest period of analysis, that is, when local and regional policies increased their influence and decentralisation was intensified. Therefore, the information comes from the Economic Census of 1993, 1998, 2003, and 2008<sup>10</sup>. In sum the model at the municipal level has  $N = 63$  and  $T = 4$ . The model for states has  $N = 29$  and  $T = 14$ , given the period 1997-2011.

The Economic Census is a survey undertaken every 5 years to a random sample in the whole country, yet it does not include any agriculture, mining or commodities production. The GDP at state and national level is estimated differently. They use information provided by the different Secretariats as well as the information collected every 5 years with the Economic Census.

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<sup>9</sup> INEGI considers urban localities those with population greater than 2500 inhabitants.

<sup>10</sup> The census were published on 1994, 1999, 2004 and 2009, respectively, and named with the publication year. However the information corresponds to the respective previous year.

Within the Economic Census, it is possible to obtain separated information for firms with national capital only and those with foreign investment, either in a joint-venture or fully foreign-owned firms. The models for cities are separated into foreign and national firms. Given that splitting the firms into these two groups is only possible from 1998 onwards, the models period is 1998-2008, although some data from 1993 is also employed.

Given that the unit of analysis are regional units, either municipalities or states. The data from Economic Census is added to include all firms within services, trade and manufacturing activities settled in the municipality. A concern is that it leads to mix very different kinds of firms, increasing the possibility for bias in the results and coefficients. Therefore, in order to partially address this issue, the models were estimated for 1) all firms within the sample, 2) manufacturing firms. In this way, the model allows accounting for more heterogeneity within the cities, of course, firm level analysis by class would account for more heterogeneity. Nonetheless, the policies to be assessed are policies that aim all economic activities within the cities, thus it is more appropriate to analyse aggregated models. Similar works at regional levels have been undertaken before (Costa-I-Font et al., 2003, Rodríguez Oreggia y Román, 2003, Rodríguez-Oreggia, 2005, Rodríguez-Oreggia and Rodríguez-Pose, 2004, Sanchez-Reaza and Rodríguez-Pose, 2002); the innovative of this work is the estimation at municipal level.

### 5.3 Variables

From the literature above cited as well as from regional theory and subject to the availability of information in Mexican databases, the variables to include in the model had been decided as follows.

As regards with the dependent variable, it is used a productivity measure, in this case is labour force productivity, since the total production is weighted with total employment in both cases, states and municipalities. This is the most common measure used, especially if the level of analysis is not the firm, when value added over productivity is more useful. However, even if this measure is less extensive than multifactor productivity measures, it is also a good indicator for regions and cities, especially because when taking gross product, the productivity increases of intermediate inputs are also taken into account in the whole measure (Schreyer, 2001).

#### 5.3.1 Municipalities

As a left hand variable it is used firms productivity, measured by the Total Gross Production (TGP) per worker. For municipalities TGP is the equivalent for GDP, although it includes both, value added and intermediate inputs, yet total gross production should be used rather than value added.

The basic model is written as follows:

$$\ln Prod_{it} = \alpha_i + \theta_t + \gamma X_{it} + \delta F_{it} + \beta_1 \ln EF\&S_{it} + \beta_2 \ln PII_{it} + \varepsilon_{it} \quad (1)$$

Where  $Prod_{it}$  is the productivity measure,  $X_{it}$  and  $F_{it}$  are control variables for regional and firms endowments respectively.  $EF\&S_{it}$  is the interest variable Economic fostering and subsidies,  $PII_{it}$  is the public investment in infrastructure.  $\alpha_i$  is the variable for regional characteristics intrinsic to each city, that do not change over the time.  $\theta_t$  Stands for year dummies.  $\varepsilon_{it}$  is the error term. Year dummies are added to diminish potential problems due to cross section dependence, although this will be also treated, as explained later.

#### *Economic fostering and subsidies*

$EF\&S_{it}$  This is the expenditure item referred before. It includes expenditures on promotion and marketing activities; support to SME's firms, transfers and subsidies to firms as well as the budget from some political parties, and other public offices such as tourism and economic development. Given that not all the item is exerted on incentives, it would have a positive effect through the support given to local firms, or the planning and policymaking. Nonetheless, given the range included here, such as wages and general budget to public offices, this expenditure item could also show a negative effect on firms' productivity. To take into account the size of the city, the variable is the amount of expenditures per employee in the city.

#### *Public Infrastructure Investment*

$PII_{it}$  This mainly comprises expenditures on public infrastructure works. Other investments to increase human capital or public security might be included here. Yet this is not well specified, nor disaggregated. It is expected to have a positive relationship to firms' productivity (Dall'erba and Le Gallo, 2008), yet given the differences in prices and corruption, the total effects might be diminished (Straub, 2008). Likewise with the previous variable, expenditures per employee in the city are used.

### *Specialisation index*

The economic diversity/specialisation had been a topic of debate. Empirical works have been undertaken to find whether crossed-spillovers, economic diversity, is better for firms productivity increments, or whether within-industry spillovers, economic specialisation, fosters more rapid increases in productivity. Results are diverse, and some support economic diversity, Jacob (1969) externalities, while others support Marshallian externalities (1890), (Glaesser et al., 1991). According to Salgado and Bernal (2011) in Mexico manufacturing firms in more diversified cities tend to invest more in technology, yet they have lower productivity growth. Thus, it could be expected a positive sign of the variable, at least for manufacturing firms.

The variable could be relative, that is, measuring the concentration of the production of determined industry in each region. Namely, the region with highest production in the country would be the most specialised on it. It is better used when researching on clusters or specific industries.

Differently, in this work the variable aim is to control for the diversity/specialisation within the same region, that is, the effects of economic structure regardless their size or the leading industry (Glaesser et al., 1991, Duranton and Puga, 2000). Therefore, the share of the industry with highest contribution to the city's production is used.

Whether the number is high, it tells about a highly specialised region, thus relatively more dependent from one industry. If on the contrary the number is low it indicates a diversified economic structure. The extreme case would be a city that is specialised to only one industry, so the number would be 1. On the opposite, since there have been taken 17 industries, if the city is evenly diversified and all economic activities were producing equal TGP proportions, the number would be  $1/17 = 0.0588$ .

### *Domestic market potential*

Given the importance of economies of scale, local and potential markets size is a significant determinant for firms' productivity, especially for manufacturing firms. It is estimated as follows:

$$MP_{jt} = \sum_1^i TGP_{it} \frac{1}{Dis_{ij}} \quad (2)$$

$\forall i$  Within 300 km travel distance.

Where  $MP_{jt}$  is the market potential of city  $j$  in the year  $t$

$Dis_{ij}$  = Km distance between municipalities

It is important to highlight that this variable includes both, local market size and outer market potential since it is also adding when  $i = j$ .

#### *Manufacturing employment share over total employment*

The economic structure in the city might be also significant for productivity growth, especially the proportion of manufacturing firms. Hence, it is commonly used as a control variable in empirical studies (Alecke et al., 2012). To some extent the specialisation variable controls for economic structure. However, a region could be specialised to tourism activities while other to services, having small share of manufacturing activities.

#### *Foreign/domestic firms productivity*

This is a control variable for crossed effects from domestic to foreign firms and vice versa. For example, the presence of foreign firms highly productive might generate competition to domestic ones. In turn, if they are in different sectors, they may not be affected, while if they are in similar economic activities there can lead to competition -negative effects- or technology transfers -positive effects-, as reviewed in the empirical works listed.

#### *Public infrastructure stock*

There is no doubt that public infrastructure is a significant determinant of firms' productivity. In Mexico, it is difficult to find information at the municipal level, and some data is not available for all years needed. Ideally, the economic infrastructure would consider energy, transports, public services, and communications endowments (Hansen, 1965). Some researchers in Mexico only use the number of land lines per head as indicator for infrastructure, others use the expenditures.

It is better to have the actual stocks than the expenditures, given that the construction costs are not always the same, either because of geographical conditions, input costs, or simply corruption (Biehl, 1988, Straub, 2008). Considering that, to build the index there were

added the physical stocks for economic infrastructure as follows: for energy, electricity supply lines per capita; for public services, water feeds per capita and sewage feeds per capita; for transports, Km of roads per area in  $\text{Km}^2$ ; and for communications, number of flight passengers per capita. It could be also included some endowments for social infrastructure such as hospital beds. But, for cities it was easier to use an alternative variable to control for health. The variable is the same as the index used in chapter 2. To see the whole method see the A.1 in the annex.

#### *Kilometres of roads*

Kilometres of main roads weighted with the municipal area in  $\text{Km}^2$ <sup>1</sup> is used as an alternative indicator for public infrastructure stock. According to Dall'erba and Le Gallo (2008) it is possible that accessibility is the most important infrastructure endowment. It may increase capital accumulation to wealthy regions given that it allows firms to increase the economies of scale given the lower transports costs.

#### *Infant mortality rate*

Infant mortality rate is used as control variable for health. It should have a negative relationship with productivity. The smaller the rate, the higher productivity, given that it is agreed that this is a good indicator for general health and wellbeing in empirical studies (Easterly, 2001).

Given that firms' productivity not only yields on regional features such as those mentioned above, control variables for internal firms' endowments have been also included.

#### *Human capital*

The human capital inside the firm will also determine the productivity level. The best indicator would be to have the employees classified into high and low skilled labour, as well as their experience, which is commonly tested in empirical studies. However, INEGI only provide data on the number of employees classified into management/other kinds of employees, operative workers, owners/decision makers, and family members. It was taken the ratio of management/other types of employees over total employment for this variable. It provides information about the relative skills of the employees. Although, the operative employees do not always stands for low skilled labour force, but no more specific information is available.

### *Electricity cost*

Especially in the manufacturing sector, the electricity cost is one of the most important inputs. It has been highlighted as a bottle neck in Mexico, which can be an important drawback for firms' productivity (Salgado Banda and Bernal Verdugo, 2011). This variable used is the proportion of electricity expenditures over total revenues. Remarking that owing to different and extreme weather conditions by regions, electricity is an important expenditure during summer, potentially affecting firms' productivity in bordering cities.

In the following table the summary statistics for all variables used at the municipal level are presented.

**Table 3.2 Summary statistics of variables at municipal level**

<i>Variable</i>	<i>Observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
Total Gross Product per employee (MXN)	252	\$388.55	296.5065	\$48.83	\$2,332.23
Human capital inside firm	252	0.1651893	0.125164	0.0114209	0.5187533
Electricity consumption share of total revenues	252	0.0105524	0.0048883	0.0024275	0.0309058
Economic diversion/specialisation index	252	0.4774761	0.1602751	0.1650831	0.9466147
Infant mortality rate per 1000 births	252	13.96909	5.56099	2.119626	33.83838
Economic Fostering and subsidies per employee (MXN)	252	\$140.99	152.24	\$0.00	\$1,082.36
Public Physical Investment per employee (MXN)	252	\$503.14	747.24	\$0.00	\$9,887.51
Public infrastructure stock index	252	22.11187	6.430653	9.138739	38.75019
Share of manufacturing employment	252	0.2743205	0.1481094	0.0388917	0.6566179
Domestic market potential. Thousands (MXN)	252	\$50,800,000.00	71600000	\$1,105,058.00	\$515,000,000.00
Km main roads per municipal area Km2	252	428.3295	407.4346	24	2333.09
Ln EF&S lagged5	189	\$133.61	154.8704	\$0.00	\$1,082.36
Ln PII lagged5	189	\$470.02	798.0178	\$0.00	\$9,887.51
Productivity of domestic firms	189	\$651.80	1103.06	-\$2,858.90	\$10,225.72
Productivity of foreign/joint venture firms	189	\$939.80	1.27E+03	\$0.00	\$9,997.07

### 5.3.2 States

The dependent variable is the total GDP over total employment in the state<sup>11</sup>. It is important to remark that, differently to the municipality, for states all industries are included because states' institutions should take into account a broader range of topics and geographic areas, including rural areas and small cities not taken into account in the municipal models. Therefore, states' expenditures on EF&S and PII and any other public resources are not only used in urban areas.

Given the differences in databases, the control variables are not the same as with municipalities. Among the similar control variables are economic specialisation, domestic

<sup>11</sup> This variable is taken from the employment surveys available for various years in INEGI.

market potential, share of employee in manufacturing activities, infant mortality rate, as well as the expenditures on EF&S and PII undertaken by the states administrations. Some differences are stated.

The basic model is written as follows:

$$\ln Prod_{it} = \alpha_i + \theta_t + \gamma X_{it} + \beta_1 \ln EF\&S_{it} + \beta_2 \ln PII_{it} + \varepsilon_{it} \quad (3)$$

$\ln Prod_{it}$  is the productivity measure.  $\gamma X_{it}$  is a group of control variables.  $\delta \varphi_t$  Is a time trend,  $EF\&S_{it}$  and  $PII_{it}$  are the interest variables,  $\theta_t$  Stands for year dummies and  $\varepsilon_{it}$  is the error term.

#### *Public infrastructure stock*

Given that there is more information about physical endowments in states, additional physical endowments are used to build the variable. The index includes not only productive infrastructure as the cities index, but also social infrastructure endowments. Following Delgado and Alvarez (2001) the infrastructure listed is divided into economic and social types.

#### Economic infrastructure

- Communications and transports:
  - Number of flight passengers per every 1000 inhabitants. This is an indicator for air traffic and the airport capacity. Of course this also indicates the demand level of the city and the touristic places have larger amount of traffic.
  - Kilometres of main roads over the total state area (Km<sup>2</sup>).
  - Number of cargo trucks per very 1000 inhabitants.
  - Ratio of people with pay-tv over total population.
  - Post offices per every 1000 inhabitants.
- Energy supply:
  - Total of water feeds over per capita.
  - Number of power points per every 1000 inhabitants in the state.

#### Social infrastructure

- Medical services

- Number of doctors per every 1000 inhabitants.
- Education
  - Number of medium-high education schools per every 1000 inhabitants.
  - Number of bachelor level schools per every 1000 inhabitants.
  - Number of Postgraduate schools for every 1000 inhabitants.

The estimation of the index is also the one used before, but with more information. The data is normalised using the maximum value of each variable. Then, the variables are averaged by category, assuming that they are interchangeable within the same category. The final index is obtained with the geometric mean of all categories.

It is important to remark that the education infrastructure was only considered medium-high and high levels, assuming that the higher availability of such education offers, allow firms to hire more easily labour force with at least 9 full years of schooling, which is higher than the national average provided by INEGI in 2010, this is, 8.6 years.

#### *Federal investment per employee*

As shown before the expenditures are still highly centralised and the investment exerted through federal programs might be also very important when fostering economic productivity. At this administrative level, there is information for federal investment, which is believed to be a highly influential tool to foster investment, productivity and economic growth across the country (Rodriguez-Oreggia and Rodriguez-Pose, 2004). The variable used is physical federal investment per employee to take the size of the state into account.

#### *US market potential*

In addition, a control variable for US market potential has been included. It is well established that many firms located in Mexico are export-based. In such cases, local or regional market potential might not influence the production scale, and consequently nor the productivity. A positive sign would indicate that firms located nearer to the border tend to be more productive, which might be due to economies of scale or better performance of foreign firms. The variable is estimated as follows:

$$USMP_{it} = \sum_i^n USGDP \times \frac{1}{Dis_{ij}} \quad (4)$$

$USMP_{it}$  is the market potential to the US for state  $i$  in the year  $t$ .

$USGDP$  is the total GDP of the four bordering states in the US, that is, Texas, California, Arizona and New Mexico.

$Dis_{ij}$  is the distance between the capital-city of state  $i$  to the US-bordering city  $j$ .

Only the four US-bordering states are included given their geographical proximity. It is assumed that firms concede less importance to US market when they are further from the border. According to Mexican officials, firms interested in exporting to California or Arizona, settle in the northwest Mexican region. Firms willing to supply markets in the east may locate in the Mexican east bordering cities. Thus, the distances were calculated in kilometres distance to the nearest bordering city in the US side. More specifically, for Mexican states in the west side, the distance is estimated to Calexico and San Diego, in California, and Naco, in Arizona. For those to the East, the reference cities are Brownville and Laredo, in Texas. The distances were calculated using real distances with google maps application.

#### *Government corruption index*

Corruption is one of the most important issues that may prevent public investments, especially in infrastructure, from enhancing productivity improvements. It is hard to find information for the whole period. The Mexican Transparency group has published several indexes at the state level for year 2001, 2003, 2005, 2007 and 2010. Even if it is available for few years, it will be used as an alternative control variable to find the extent to what corruption is related with regional productivity losses.

#### *FDI flows per employee*

There is a census for inward FDI; new and reinvestments. The problem with this census is that many firms are registered where the headquarters of the firm are located, rather than in the place where the investment takes place. This is problematic when trying to link this with the regional productivity. Thus, this is included as an alternative variable in the model.

#### *Expenditures at municipal level on EF&S and PII*

The expenditures from municipal administrations in the biggest cities in Mexico are tested in the previous model. Then, two variables with the local expenditures on EF&S and PII items, including all municipalities in each state are added to test both effects at the same time. Similarly to all the expenditures variables, the variable used is the amount of expenditures per employee.

As regards with firms input costs, given that this data is not firm level, there is no information available for inputs costs as detailed as in the Economic Census.

The summary statistics for the variables are in the following table 3.3

**Table 3.3 Summary statistics for variables at the state level.**

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Min</i>	<i>Max</i>
GDP per worker (Thousands MXN)	435	\$ 160.25	\$ 52.85	\$ 74.22	\$ 341.14
Infant mortality rate	435	17.5525	4.2564	9.6969	33.1536
Public Infrastructure stock	435	43.51082	8.893582	18.52248	75.74472
Specialisation	435	0.2660693	0.0585489	0.1799	0.5487
Market potential (Thousands MXN)	435	\$ 199,000,000.00	\$ 162,000,000.00	31,000,000.00	\$ 906,000,000.00
Federal public investment per employee (Thousands MXN)	435	\$ 4,695.12	\$ 2,350.71	\$ 1,402.79	\$ 22,464.32
Manufacturing employment	435	0.1666206	0.0652969	0.0498739	0.3240274
Economic Fostering and subsidies per employee (MXN)	435	\$ 8,177.37	\$ 3,521.27	\$ 0.00	\$ 19,096.22
Public Physical Investment per employee (MXN)	435	\$ 1,589.71	\$ 1,168.55	\$ 126.74	\$ 12,657.41
US market potential (Thousands MXN)	435	\$ 130,000,000.00	\$ 493,000,000.00	10,800,000.00	3,130,000,000.00
Government Corruption index	145	7.597931	3.080956	1.8	18.8
FDI per employee lag5 (Thousands USD)	435	\$ 3.93	\$ 9.03	-\$ 2.69	\$ 68.12
Municipal expenditures EF&S per employee (Thousands MXN)	435	\$ 378.90	\$ 210.15	\$ 40.57	\$ 1,644.53
Ln Municipal expenditures PII per employee (Thousands MXN)	435	\$ 1,068.92	\$ 576.09	\$ 97.75	\$ 3,066.12

## 5.4 Estimation methodology

### 5.4.1 Municipalities

Given the nature of the data, the estimations should include Fixed effects (FE) to control for those features intrinsic to the regions, invariable over the time, which are not captured with the variables in the model. In addition, given that these regional entities within the same country and due to their geographic neighbouring, there could be a factor common to all panels in the error term, violating one of the most important assumptions of FE models, that is, and independence across panels (Driscoll and Kraay, 1998, Hoechle, 2007). It could be caused by the macroeconomics trend, the violence, US crisis, laws, trade openness, or any shock that may affect the country in general and it is not included in the model.

To keep a fixed effects approach, the method used by Driscoll and Kraay (1998) is going to be used as the base for the models in this work. The authors proposed a variation in standard errors that allows correlation across panels and over the time. Moreover, the covariance matrix is robust to heteroskedasticity. The model performs well with finite samples, even in cases like the present models with  $N$  considerable higher than  $T$ , although bigger  $T$  is recommended (Hoechle, 2007). If the models do not have cross section dependence but only heteroskedasticity it is better to do just White standard errors.

For large samples there is also the option of clustered standard errors by Thompson (2011) which also tackle dependence across panels and in time. Stata also allows using clustered standard errors that deal with one problem at the time, yet it is no suitable for this panel given the size of  $T$ .

Due to the nature of the data it could be also expected to have endogenous variables in the panels. It is likely that regions with higher productivity also have more money to spend for fostering investment or for building public works; this could exacerbate uneven economic performance. The larger expenditures induce higher productivity growth and this in turn allows for more expenditures. In case of EF&S it could be highly endogenous when estimating the model for foreign firms, given that, as shown before, foreign firms are more likely to obtain subsidies and many marketing actions would have the aim of bringing more FDI. Thus, difference GMM estimator is used. It is preferred to systems GMM, since no level equations are required, thus in this case the model is more efficient. There is a discussion whether systems GMM performs better than difference GMM. Nevertheless, according to Bond et al (2001) whether the dependent variable is not lagged, no persistent series are present and there is only potential endogeneity of right hand variables, the Sargan test of Overidentifying restrictions and related tests are enough to assess the validity of the instruments. In such case, simply the lags of the instrumented variables can serve as instruments. If the test validates the instruments, it is enough to test the validity of the model.

#### 5.4.2 States

Similarly to the municipalities, it is necessary to take into account FE when estimating states models. Moreover, given the geographic interaction and the external shocks, it is also expected to find cross-section dependence. Since the number of  $T$  is larger, other

models to deal with cross section dependence can be also tested. The clustered standard errors proposed by Thomson (2011) are not suitable given the size of the panel. Additionally it is more commonly used with autoregressive models in financial analysis.

Other method that could be used in this model is the linear regression with Panel Corrected Standard Errors (PCSE). This method is known to work well with models in which N and T are similar size (Hoechle, 2007). Although more years are available for states, T is still about the half of the regional units. This is not a FE approach, but pooled OLS. Therefore the results between these two models are very close, as it will be shown in the estimations results. One disadvantage compared to Driscoll and Kraay described before is that PCSE considers that the intercorrelation between units is the same for all time points.

The methods based on Pesaran (2006), common correlated effects with the options of mean group estimator and augmented mean group estimators, allow for cross sectional dependence as well as common factors across panels. Chudik et al. (2011) provides good evidence of the consistency of these models in presence of cross sectional dependence, defining also two types of dependence: weak and strong. The models are ideally designed for large panels, yet Chudik et al. (2011) provide Montecarlo simulations for small sample properties, which proved good performance from  $N=20$  and  $T=10$ . Nevertheless, given the way it is modelled, the cross section dependence reduces as N increases relative to T. Additionally, Chudik et al (2011) showed that in the case of FE method, the models behaved very poorly, hence it is not possible to keep the FE approach when using these models. Furthermore, a larger panel would be better. In consequence, in this panel data, CCEMG (Common Correlated Effects Mean Group Estimator) and the Augmented estimator are less efficient compared to Driscoll and Kraay, which uses FE and provide consistent standard errors for cross section across panel and autocorrelation, assuming also heterogeneity. Considering this, results with the different estimation methods are presented and discussed in the results section.

## 6. Results

### 6.1 Municipalities

Hoyos and Sarafidis (2006) proposed a test for cross sectional dependence. Three options could be used, Pesaran, Frees and Friedman. Hoyos and Sarafidis recommend comparing the results of the three tests. Pesaran works better with large T, and Frees show more accuracy when  $T=30$ . Pesaran and Frees reject the null of no cross-section dependence,

while Friedman accepted the null. In this case, given that the correlation matrix has lot of positive and negative correlations, Friedman test is weakened, thus Frees would be more reliable, which confirms cross section dependence. These tests are only for reference, since given the size of the sample, the variation in positive and negative correlations and the high value of absolute correlation, 0.541, either test could be weakened. Yet, given the nature of the data it is believed that cross section independence assumption is violated, and this should be addressed

In order to compare the results and test which method is more appropriate, pooled OLS, FE with robust standard errors, FE with Driscoll and Kraay (DK) standard errors, and difference GMM with forward orthogonal deviations (FOD) are shown in that order in Table 3.4. Difference GMM with FOD proposed by Arellano and Bover (1995), allows to keep FE approach, it does not drop the first observation and permits the variables to be instrumented with the lags of the explanatory variables.

It was assumed that EF&S and PII are endogenous, thus, they were added as the GMM-style variables. It was allowed up to 2 lags, using the option collapse to avoid a large number of instruments; these results are in column (4). An additional option was to employ larger lags of these variables as excluded instruments. The results using the values of EF&S and PII in 1991 as external instruments are in column (5).

Pooled OLS results are less accurate than the others and its coefficients are highly biased. Comparing FE –column (2) - and FE with DK standard errors –column (3)- the coefficients are the same, yet the standard errors in the latter are smaller at least 25%, which allows some variables to be statistically significant in the DK estimations. In the columns (4) and (5) the signs are the same as FE estimations and the coefficients are very similar, except for Human capital, which is about the same size as in the pooled OLS model. The Hansen tests P-values show that the instruments in GMM estimations are valid. Given that EF&S and PII have the same sign and similar coefficient, it can be said that no treatment for endogeneity is needed in the model.

In this baseline model most variables have the expected sign. The interest variables are significant. The diverse kinds of support given to firms, and the efforts to attract more investments into the cities have had positive effects on aggregate productivity, that is, the expenditures on EF&S. On the contrary, PII per employee showed a negative correlation

with the dependent variable, indicating that PII investments do not effectively foster productivity of private firms. Still its influences is much larger than EF&S, the size of its coefficient is about more than two times bigger, indicating possible poor investment decisions, and corruption.

The sign of electricity confirms the claim by Salgado and Bernal (2011), that electricity consumption can be a significant obstacle for firms productivity. Firms seem to be more productive in cities with higher economic specialisation, which was also highlighted by the same authors. Nonetheless, it seems that decreasing returns of scale might be happening in places with high proportion of employment in manufacturing activities, since the increments in productivity are negatively related to this variable.

**Table 3.4 Baseline results. Full model 1993-2008**

Dependent variable: Total Gross Production per employee	(1)	(2)	(3)	(4)	(5)
	OLS_baseFull	FE_baseFull	DK_baseFull	Gmm_baseFull	Gmm_baseFull2
Human capital inside firm	1.8986** (0.7442)	0.8043** (0.3500)	0.8043* (0.4246)	0.7295** (0.3474)	0.7353** (0.3469)
Ln Electricity consumption	0.0924 (0.0771)	-0.1423*** (0.0391)	-0.1423*** (0.0276)	-0.1480*** (0.0395)	-0.1475*** (0.0394)
Specialisation	1.7036*** (0.3121)	0.2542** (0.1070)	0.2542*** (0.0868)	0.2594** (0.1071)	0.2591** (0.1071)
Infant mortality rate	-0.0041 (0.0057)	-0.0026 (0.0025)	-0.0026** (0.0012)	-0.0028 (0.0025)	-0.0028 (0.0025)
Ln EF&S	0.0031 (0.0091)	0.0059** (0.0029)	0.0059*** (0.0019)	0.0051 (0.0030)	0.0051* (0.0030)
Ln PII	-0.0151 (0.0247)	-0.0157 (0.0100)	-0.0157** (0.0074)	-0.0102 (0.0104)	-0.0106 (0.0102)
Public Infrastructure stock	-0.0030 (0.0056)	0.0024 (0.0093)	0.0024 (0.0026)	0.0020 (0.0095)	0.0021 (0.0095)
Ln Market potential	0.3718*** (0.0345)	0.7834*** (0.0755)	0.7834*** (0.0123)	0.7824*** (0.0768)	0.7824*** (0.0768)
Ln Manufacturing employment	0.0754 (0.0593)	-0.1782** (0.0855)	-0.1782*** (0.0207)	-0.1846** (0.0894)	-0.1840** (0.0891)
Constant	-1.0873 (0.7086)	-8.6070*** (1.1147)	-8.6070*** (0.1587)		
Obs	252	252	252	189	189
N_clus	63	63		63	63
r2	0.794	0.941			
Instruments				16	18
Autocorrelation test AR(1) p-value				0.002	0
Autocorrelation test AR(2) p-value				0.248	0.249
Hansen J statistic (overidentification test)				0.885	0.763

Standard errors in parentheses  
\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Infrastructure has been proved to be a significant driver for regional GDP growth; nevertheless, the coefficient sign in these results is not significant. A reason could be that cities with higher productivity might have relatively less public infrastructure. According to Fuentes (2003) cities with faster economic growth, which might also have large productivity increments, tend to have relative smaller amount of infrastructure, given that it

is difficult to keep track on the infrastructure construction demand by people and firms; especially in the north region.

Alternatively, in table 3.5, column (2) is shown the alternative model using only the Kilometres of roads as an infrastructure indicator, which showed a positive sign. This is in line with the statements of Dall’erba and Le Gallo (2008) that roads are more meaningful for firms productivity increases than some other public infrastructure. The baseline results are kept in column (1) with comparison purposes.

**Table 3.5 Results including domestic and foreign firms together 1993-2008. Using Driscoll and Kraay method.**

ALL FIRMS 1993-2008						
Dependent variable: Total Gross Production per employee	All firms			Manufacturing		
	(1) Base	(2) Base_Roads	(3) Base_lags	(4) Base	(5) Base_Roads	(6) Base_lags
Human capital inside firm	0.8043* (0.4246)	0.8302* (0.4318)	0.5593* (0.3256)	0.6765 (0.4846)	0.6793 (0.4939)	0.5119 (0.3349)
Ln Electricity consumption	-0.1423*** (0.0276)	-0.1446*** (0.0281)	-0.1517*** (0.0325)	-0.2194*** (0.0474)	-0.2193*** (0.0472)	-0.2203*** (0.0468)
Specialisation	0.2542*** (0.0868)	0.2555*** (0.0867)	0.2703*** (0.0799)	-0.8845*** (0.1768)	-0.8853*** (0.1755)	-0.8620*** (0.1767)
Infant mortality rate	-0.0026** (0.0012)	-0.0025* (0.0013)	-0.0027** (0.0010)	-0.0053*** (0.0017)	-0.0054*** (0.0019)	-0.0044*** (0.0014)
Ln EF&S	0.0059*** (0.0019)	0.0054** (0.0023)		0.0098* (0.0053)	0.0098* (0.0054)	
Ln PII	-0.0157** (0.0074)	-0.0157** (0.0073)		-0.0052 (0.0106)	-0.0051 (0.0102)	
Public Infrastructure	0.0024 (0.0026)		0.0011 (0.0019)	0.0009 (0.0032)		0.0007 (0.0025)
Ln Market potential	0.7834*** (0.0123)	0.7844*** (0.0129)	0.7707*** (0.0175)	0.8660*** (0.0396)	0.8656*** (0.0405)	0.8584*** (0.0408)
Ln Manufacturing employment	-0.1782*** (0.0207)	-0.1801*** (0.0170)	-0.1787*** (0.0123)	-0.6264*** (0.0167)	-0.6282*** (0.0120)	-0.6265*** (0.0211)
Ln Km main roads		0.0238** (0.0100)			-0.0017 (0.0081)	
Ln EF&S lagged5			-0.0070*** (0.0021)			0.0052** (0.0024)
Ln PII lagged5			0.0071** (0.0028)			-0.0024 (0.0042)
Constant	-8.6070*** (0.1587)	-8.7288*** (0.1353)	-8.4025*** (0.1622)	-10.2626*** (0.6526)	-10.2272*** (0.6818)	-10.0920*** (0.7410)
Obs	252	252	252	252	252	252

Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

The results for manufacturing firms are slightly different. Opposite to the total results, the baseline model for manufacturing firms in column (4) of Table 3. Table 3.5 Results including domestic and foreign firms together 1993-2008. Using Driscoll and Kraay method. showed that manufacturing firms benefit more from economic diversity rather than specialisation, in favour of Jacobs externalities, mentioned before. The domestic market potential coefficient is about 30% higher. Local expenditures in EF&S and PII have the same effect direction compared to total firms, yet PII is not statistically significant.

It is noticeable that the coefficient for electricity is at least 50% higher for manufacturing firms. That is, productivity per worker is negatively affected by electricity cost to a higher extent than the total firms' average. The human capital inside the firm showed a positive sign, still, it is not significant for manufacturing firms. This could be a result of the firm nature. Manufacturing firms are expected to have larger proportions of operative labourers, rather than management ones; which does not regard with skills or experience inside the firm. In consequence, the measurement management/other type of employees over total employments is not effective as human capital indicator. As regards with infrastructure neither public infrastructure stock nor Km of roads –column (5)- are positively related to productivity increases.

In table 3.5 alternative results are presented using the 5<sup>th</sup> lag of EF&S and PII instead. Notice that given the larger availability of expenditures data –differently to production data- it is possible to have lags without losing one observation in the whole model. It is observed that the coefficients changed in the opposite way in column (3). That is, when using the lagged variables, EF&S effect is negative, while PII is positive. An interpretation is that policies to support firms do not show a positive effect on firms productivity within the following 5 years, confirming that some types of support could actually foster inefficiencies inside the firms (Bernini and Pellegrini, 2011). While investment in public infrastructure actually showed positive effects in the following 5 years. For manufacturing firms in column (6), the signs remain, but PII is still not significant, which is indicating that PII expenditures do not effectively ease production conditions for firms. Yet, it might be good for some firms, since the effect is not definitively negative.

Now the results are separated into domestic and foreign/joint-venture firms. These are presented in table 3.6 and table 3.7, respectively. First, observing results in Table 3.4, domestic firms, some differences with the previous tables can be noticed. EF&S is not statistically significant in any case, indicating that the help provided by municipalities is not effectively fostering productivity. PII coefficient increased considerably, especially for manufacturing firms, indeed, the coefficient in column (4) is two times larger than column (1) -this is for total firms- still with a negative effect. Additionally, compared to baseline results, the coefficient is also larger. It could be related to the period, given that the fiscal resources have increased over the time, when the period considered is more recent, the coefficients are larger; additionally to the fact that the previous results are for all firms, and these ones only for domestic firms.

Diversity in cities is good for productivity of total firms in column (1), yet this is not true for manufacturing firms in column (4). Other variables such as human capital inside the firm, market potential, manufacturing employment, and electricity costs also showed higher coefficient than the previous results, especially for manufacturing firms. Infant mortality rate do not have the expected sign in the total results, and it is not statistically significant for manufacturing firms.

The productivity of foreign firms has been also included as an explanatory variable. It was explained before that this is only possible for this period 1998-2008. Its coefficient is negative and statistically significant when estimating results for all domestic firms in column (1). It indicates that there might be competition with foreign firms. That is, increases in productivity of firms with foreign investment, leads to productivity losses for national firms. The variable is still negative but it is much smaller for manufacturing firms, as shown in column (4). Perhaps the increments of foreign firms' productivity might be have very different effects across industries and firms, creating competition and productivity decreases in some firms, while fostering it in others. According to Jordaan (2008; 2011) foreign firms in Mexico might have vertical backward spillovers, transferring technology and fostering productivity of suppliers' chain in the automotive. Yet, there might be also losses and displacement of others, since negative horizontal effects exist.

**Table 3.5 Results for domestic firms. Using Driscoll and Kraay method.**

NATIONAL FIRMS 1998-2008:	All firms			Manufacturing		
	(1) Base	(2) Base_Roads	(3) Base_Lags	(4) Base	(5) Base_Road	(6) Base_Lags
Dependent variable: Total Gross Production per employee						
Human capital inside firm	0.8420 (0.5851)	0.7063 (0.4842)	1.0378 (0.6588)	0.1691 (0.1287)	0.1040 (0.1623)	0.1999 (0.1312)
ln Electricity consumption	-0.4068*** (0.0275)	-0.3992*** (0.0227)	-0.4009*** (0.0278)	-0.5247*** (0.0342)	-0.5003*** (0.0544)	-0.5252*** (0.0376)
Specialisation	0.3390** (0.1644)	0.4097** (0.1927)	0.3955** (0.1529)	0.6036* (0.3021)	0.5449* (0.2836)	0.6676* (0.3585)
Infant mortality rate	0.0078*** (0.0016)	0.0088*** (0.0014)	0.0078*** (0.0013)	-0.0049 (0.0055)	0.0005 (0.0079)	-0.0040 (0.0041)
Ln EF&S	0.0163 (0.0136)	0.0152 (0.0119)		0.0203 (0.0146)	0.0144 (0.0186)	
Ln PII	-0.0375*** (0.0086)	-0.0367*** (0.0085)		-0.0650*** (0.0179)	-0.0728*** (0.0151)	
Public Infrastructure	-0.0085 (0.0141)		-0.0107 (0.0148)	-0.0725*** (0.0099)		-0.0731*** (0.0089)
Ln Market potential	0.7499*** (0.1418)	0.7581*** (0.1353)	0.7554*** (0.1120)	0.8831*** (0.0468)	0.9033*** (0.0693)	0.8416*** (0.0629)
ln Manufacturing employment	-0.3725** (0.1706)	-0.3548** (0.1638)	-0.3816*** (0.1348)	-0.6364*** (0.1688)	-0.6335*** (0.1896)	-0.5428*** (0.1289)
Ln Productivity foreign firms	-0.1071*** (0.0212)	-0.1147*** (0.0197)	-0.1204*** (0.0207)	-0.0244** (0.0096)	-0.0182* (0.0091)	-0.0292** (0.0143)
Ln Km main roads		0.0726** (0.0323)			-0.1151** (0.0469)	
Ln EF&S lagged5			0.0021 (0.0020)			-0.0121 (0.0117)
Ln PII lagged5			0.0429*** (0.0131)			0.0082 (0.0337)
Constant	-9.0291*** (2.5050)	-9.6814*** (2.2640)	-9.4161*** (1.9133)	-10.2988*** (0.8700)	-11.5023*** (1.1483)	-9.7254*** (1.2905)
Obs	188	188	188	171	171	171

Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

The public infrastructure stock is not statistically significant for total firms, and it is negatively correlated to productivity in case of manufacturing. When using the alternative estimations, similarly to the results in table 3.5, the Km of roads are significant and positively related to productivity of total firms, while it has a negative sign in case of manufacturing firms. In the results including all firms in table 3.5, it was not statistically significant in case of manufacturing, column (5), but it was for positive and significant for total firms. Now, when splitting the results, it is positive and significant for foreign manufacturing firms –shown in the next table-, and negative for domestic ones. It is clear, thus, that domestic firms benefit less of the infrastructure stock existing in cities, given that their needs might be completely different to the foreign firms, mostly willing to export.

The baseline results for foreign firms shown in table 3.6, column (1) confirm significant differences compared to domestic firms. In first place, economic specialisation is more important for foreign firms.

Public infrastructure stock is negatively correlated with the productivity outputs and the coefficient is much larger and significant, compared to domestic firms, and the size is even larger for manufacturing. An increment of 10% in the public infrastructure stock caused 4.1% of productivity losses in total foreign firms, column (1). For manufacturing firms the elasticity is such that 10% of infrastructure stock is related to 8.2% productivity losses. It could be also interpreted in a different way; firms located in places with better infrastructure are not necessarily the most productive. These results are in line with the results by Fuentes (Fuentes, 2003) who pointed out that the border region of Mexico have lot of infrastructure deficiencies, and cities with the best infrastructure are not the most productive.

When including kilometres of main roads instead of total public infrastructure in column (2), the variable is significant, positive, and its coefficient much larger for all firms. The coefficient is a bit smaller for manufacturing firms-column (4)-, still high and positive. This is clearly related with the type of foreign investments existing in Mexico, which usually need good transport means.

It is interesting to find that both expenditures from local governments showed a negative correlation, and they are not statistically significant in the baseline results, although EF&S becomes significant in the alternative model in column (2). Perhaps, roads infrastructure is

a better indicator for foreign firms, which helped to increase efficiency in the model. The coefficient of EF&S becomes significant with a larger coefficient and smaller standard error, thus the baseline results could be downwards biased.

**Table 3.6 Results for foreign and joint-venture firms. Using Driscoll and Kraay method.**

<b>FOREIGN AND JOINT-VENTURE CAPITAL FIRMS 1998-2008:</b>						
Dependent variable: Total Gross Production per employee	All firms			Manufacturing		
	(1) Base	(2) Base_Roads	(3) Base_Lags	(4) Base	(5) Base_Road	(6) Base_Lags
Human capital inside firm	2.0810*** (0.2073)	2.1255*** (0.2147)	2.0733*** (0.1918)	-0.0020** (0.0008)	-0.0027*** (0.0009)	-0.0021** (0.0009)
Ln Electricity consumption	-0.3919*** (0.0264)	-0.3835*** (0.0357)	-0.3812*** (0.0249)	-0.4138*** (0.0182)	-0.4261*** (0.0200)	-0.4134*** (0.0156)
Specialisation	1.9658* (1.1196)	2.1996** (1.0971)	1.9295* (0.9792)	1.2530 (0.9069)	1.3964 (0.9364)	1.1347 (0.8524)
Infant mortality rate	0.0402*** (0.0080)	0.0426*** (0.0074)	0.0400*** (0.0121)	0.0797*** (0.0047)	0.0852*** (0.0044)	0.0824*** (0.0064)
Ln EF&S	-0.0168 (0.0104)	-0.0272*** (0.0072)		-0.0223 (0.0221)	-0.0224 (0.0190)	
Ln PII	-0.0344*** (0.0107)	-0.0305** (0.0119)		-0.0855** (0.0337)	-0.0735*** (0.0269)	
Public Infrastructure	-0.0186*** (0.0030)		-0.0169*** (0.0023)	-0.0489*** (0.0116)		-0.0550*** (0.0110)
Ln Market potential	0.6960*** (0.2427)	0.7313*** (0.2489)	0.7099*** (0.1822)	-0.6221*** (0.2208)	-0.6360*** (0.1714)	-0.7322*** (0.2167)
Ln Manufacturing employment	-0.9033*** (0.1396)	-0.8703*** (0.1432)	-0.8200*** (0.1253)	-0.9200 (0.5909)	-0.7543 (0.5757)	-0.5736 (0.5406)
Ln Productivity domestic firms	-0.6323*** (0.0525)	-0.6640*** (0.0619)	-0.6446*** (0.0502)	-0.3389** (0.1353)	-0.3262** (0.1237)	-0.3496*** (0.1277)
Ln Km main roads		0.4900*** (0.1297)			0.4284*** (0.1261)	
Ln EF&S lagged5			-0.0129*** (0.0039)			-0.0617*** (0.0059)
Ln PII lagged5			0.1204*** (0.0197)			0.0127 (0.0416)
Constant	-6.0775 (3.6894)	-9.7407*** (3.0429)	-6.9976** (2.7423)	16.5032*** (3.7923)	13.0859*** (3.9888)	18.6630*** (4.0510)
Obs	188	188	188	169	169	169

Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

In the case of EF&S the negative correlation could be due to inefficiencies fostered when firms receive grants, or other types of support. On the other side, the coefficient sign could be caused by competition with domestic firms. As said before, the resources spent by municipalities to support firms are mainly addressed to domestic firms, and it actually showed a positive effect in table 3.6. Hence EF&S might indirectly affect foreign firms' productivity, since higher productivity in national firms has a negative correlation with foreign firms' productivity, see column (1).

PII showed null effects over productivity of foreign firms. When using the lags of the interest variables, column (3), the sign of PII changed. Hence, within 5 years-time, public investments at the local level might have positive effects on productivity growth. While the coefficient sign for EF&S remained negative for foreign firms. It could be either because any support received by means of tax exemptions –municipalities rarely give cash grants to foreign firms, but exemptions in local taxes/fees- negatively affect productivity by

fostering inefficiencies, or because it might enhance the productivity of domestic firms, which is in detriment of the former.

Infant mortality rate showed an opposite sign to what was expected in all models. Electricity consumption as well as with domestic firms, it is negatively related to productivity increases. Human capital, in fact tells that firms with more employees other than operative are more productive. Yet this is not true for manufacturing firms. As said before, this is related to the kind of production not to skills and qualification.

Among other differences for manufacturing firms is the negative sign of market potential. It regards to the type of firms, frequently exports-oriented. In addition, similar to domestic firms, human capital showed a negative sign. Because manufacturing firms benefit more from operative labourers, rather than admin and management.

The productivity increases of domestic firms seem to affect more importantly the productivity of foreign firms than the other way round, which is valid for both estimations; total and manufacturing. Competition between domestic-Foreign/joint ventures, seem to be happening, since at the city level, increases in domestic firms' productivity negatively affect to foreign firms and vice versa. It is clear that, foreign investment have fostered economic growth in Mexico (Jordaan and Rodriguez-Oreggia, 2012), and it has generated positive externalities between industries, but negative externalities within industries (Jordaan, 2008b).

The negative sign of the alternative productivity variables, this is the foreign firms' productivity and domestic firms' productivity respectively, in column (1) of table 3.5 and 3.6, could be explained by the existence of competition between foreign and domestic firms for public resources, suppliers; skilled labour force, etc., even if firms do not compete in the same markets. Furthermore, if they are in similar activities, for instance tourism services, and other services; foreign firms do not benefit of more productive domestic firms, because it becomes more difficult to penetrate the market, while if foreign firms are more productive, domestic enterprises are negatively affected and probably displacing some. This on the one side could foster larger efficiency (Javorcik et al., 2008). On the other side, it may entail that domestic firms simply leave business migrating to less competitive markets which induces a general reduction on their aggregate productivity.

## 6.2 States

First, given the possibility of endogenous variables, there have been tested the interest variables likewise in the case of cities. According to Costa-I-Font et al. (2003) federal investment is a significant driver for GDP growth, and it does not respond to equalisation or any other criteria, but it is likely to respond to political reasons. It has been also identified as a potential driver for regional inequalities (Rodríguez Oreggia y Román, 2003). For these reasons, it is possible that wealthier states have received more federal investment through the years increasing their productivity, thus, this variable is potentially endogenous. In view of that, similarly to what is has been done before; difference GMM estimations have been performed to test endogeneity of EF&S, PII and federal investment variables, using FOD as well.

In addition, cross-section dependence has been tested with Hoyos and Sarafidis (2006) tests. Pesaran, Frees and Friedman rejected the null of no-cross section dependence, which is the expected result, and it is consistent with what it was found for cities. Estimations using the pooled OLS, FE with White standard errors, FE with DK standard errors, CCEMG, PCSE and difference GMM have been performed. The comparison of different estimations methods are presented in table 3.7.

First, it is observed that the results from pooled OLS –column (1)- and PCSE –column (2)- are very similar, the coefficients are just the same, but the latter is more efficient given the smaller standard errors, which increases the significance of some variables. The sign are in line with most of the other models, and just the size varies. Nonetheless, given the importance of individual FE, it has been decided to use a model which has taken this into account. It is important to mention that, differently to the municipal models, it was not possible to include all the year dummies due to collinearities and very few degrees of freedom.

The coefficient signs of the FE with White standard errors –column (3)- and FE DK –column (4), are consistent with what was expected. The standard errors of DK are smaller, confirming that modelling cross section dependence helps to improve the model, as shown when using the PCSE method, compared to pooled OLS.

In the difference GMM model with FOD -column (5)- the EF&S, PII and Federal investment per employee have been treated as endogenous. It was allowed up to 3 lags for

instrumenting, using the collapse option to reduce the number of instruments generated. Given the values of the AR (2) and Hansen P-values, it can be said that the model is valid (Bond et al., 2001). The results showed coefficients downwards biased compared to the FE models, especially for PII, still the signs are consistent with the previous results, indicating that endogeneity is not an issue, yet these differences could be due to the cross section dependence that was detected according to the tests performed. Also, if tested separately as GMM-style variables, the three of them accept the null of exogeneity.

The last two columns show the CCEMG and CCEAMG estimators, both allow for cross section dependence, modelling in the standard errors and allowing for common factor variables (Chudik et al., 2011). It can be seen that both models are not consistent with what was expected from the size and coefficients signs. One reason could be the size of the panel, which is very moderate. Indeed, it is recommended for larger panels, still small sample tests were provided. Nonetheless, as the cross section dependence reduces with the level of N, in this case it is almost 1 to 2, respect to the T available, this could affect the results. Additionally, the common factors and averages across panels reduce degrees of freedom, which could also considerably affect the efficiency of the model. This is reflected in the size of the standard errors, which are much larger than the previous models. In view of this, it has been decided that the DK method is the best for the states models as well as for municipalities. In fact, the performance of the model should be improved at T has increased.

From the baseline results, expenditures on PII have fostered higher productivity growth more importantly than EF&S, which coefficient is one decimal point less to the right. In both cases the effects are positive, differently to the results obtained at the municipal level. That could indicate better planning, higher efficiency at the state level, especially on PII. The larger coefficient of the PII, compared to EF&S, could be because PII potentially increases public infrastructure for everyone, while EF&S is usually much narrowed.

Federal investment per employee coefficient is almost five times bigger than the PII coefficient, and about twenty times EF&S. For 10% increase in federal investment per employee there is a 0.58% increase in productivity. Smaller results are obtained if more money is invested by state governments; by 10% increase in PII and EF&S, there is 0.14% and 0.03% productivity growth, respectively. That could indicate either higher inefficiency in federal expenditure, or major limitations from states governments to spur productivity

growth given their smaller budgets, or less effective investment projects. Also, given that the whole state is taken into account, it may happen that projects and incentives could be fostering productivity only in some economic sectors, thus the total effect is small.

**Table 3.7 Baseline results for states.**

Dependent variable: GDP per worker*	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	base_OLS	base_PCSE	base_Fe	Base_DK	base_GMM	base_CCEMG	base_CCEAMG
Infant mortality rate	-0.0583*** (0.0115)	-0.0583*** (0.0024)	-0.0254** (0.0113)	-0.0254*** (0.0077)	-0.0234** (0.0114)	0.0256 (0.0696)	-0.0005 (0.0068)
Public Infrastructure stock	0.0106** (0.0039)	0.0106*** (0.0011)	0.0015 (0.0016)	0.0015* (0.0008)	0.0016 (0.0017)	-0.0035 (0.0038)	-0.0010 (0.0016)
Specialisation	1.5603*** (0.3470)	1.5603*** (0.1435)	0.4650 (0.3345)	0.4650*** (0.0854)	0.4987 (0.3352)	-0.1384 (0.1591)	0.1981 (0.1927)
Ln Market potential	0.1240** (0.0556)	0.1240*** (0.0085)	0.4361* (0.2152)	0.4361*** (0.0591)	0.4402* (0.2186)	0.2320** (0.0778)	0.5736*** (0.1079)
Ln Federal public investment	0.0989* (0.0580)	0.0989*** (0.0180)	0.0586** (0.0249)	0.0586*** (0.0122)	0.0516*** (0.0170)	0.0868 (0.0444)	0.0215 (0.0252)
Ln Manufacturing employment	0.0863 (0.0842)	0.0863*** (0.0178)	0.0361 (0.0369)	0.0361 (0.0460)	0.0291 (0.0369)	0.1302 (0.0855)	-0.0932* (0.0457)
Ln EF&S	0.0070 (0.0078)	0.0070** (0.0032)	0.0036* (0.0019)	0.0036** (0.0016)	0.0023* (0.0014)	0.0318 (0.0582)	0.0083 (0.0179)
Ln PII	0.0237 (0.0248)	0.0237** (0.0096)	0.0143** (0.0064)	0.0143*** (0.0050)	0.0025 (0.0044)	0.0096 (0.0225)	0.0002 (0.0068)
Ln US market potential	0.0158 (0.0216)	0.0158*** (0.0041)	-0.1909** (0.0717)	-0.1909*** (0.0627)	-0.9824* (0.5112)	0.0000 (0.0000)	0.0050 (0.1586)
c_d_p							1.4364*** (0.2826)
Obs	406	406	406	406	377		
N_clust	29	29					
r2	0.813	0.813	0.504				
Instruments					30		
Autocorrelation test AR(1) p-value					0.002		
Autocorrelation test AR(2) p-value					0.300		
Hansen J statistic (overidentification test)					0.776		
Standard errors in parentheses							
* p<0.10 ** p<0.05 *** p<0.01							
*The number of employees has been taken from the employment surveys undertaken by INEGI, that is, ENE and ENOE.							

The US-market potential showed negative coefficients, indicating that in average, the proximity to the border has not fostered higher productivity compared to other states in the country, particularly those in the centre with long history of industry development such as Puebla, Queretaro, Guanajuato, Estado de Mexico, and Distrito Federal, even if this last is not in the sample. Domestic market potential is the most important variable, with the highest elasticity, indicating the importance of economies of scale and scope.

Likewise, although human capital have been pointed out as a regional growth driver by some researchers in Mexico, it was not a separated control variable because there have been added variables standing for availability of education in the infrastructure index, which showed a positive correlation and large size.

Similarly to the cities results it is clear that economic specialisation is positively related with productivity. The interpretation of the coefficient is not easy since it is the share of the most important industry in the state. Generally speaking, variables that are measured as semi-elasticity in models with a dependent variable in natural logarithms are interpreted as

the increment in the dependent variable by increments per unit in the independent variable. In this case, the increases in the variable is always less than one, thus what matters more is the sign, and the fact that those states more specialised showed to be more productive as well. As regards with the share of manufacturing industry, states with higher participation of industrial employment did not show larger productivity growth. The coefficient is positive, but it is not statistically significant.

After these baseline results, some other variables depicted before are added, and the results are shown in table 3.8. In the table, baseline results are shown in the first column to keep a comparison point, and show that the models are consistent with the base model, yet the coefficients change a little when including the other variables.

In column (2), the corruption variable is added. The number of observations is reduced to 185, given the fewer observations available for corruption index, 2001-2010. All variables have the same sign to the base model, except for the share of manufacturing employment which becomes negative, still insignificant. The size of the interest variables changed, EF&S increases one digit to the left, and PII decreased one digit to the right. Federal investment coefficient became insignificant. In all cases the period could be the cause for the changes. The coefficient for corruption is negative and its size is even larger than public infrastructure stock. From these results, it is noticed that aggregate productivity can be similarly affected by government corruption than by infrastructure endowments. In turn, corruption could become more important than the expenditures exerted on PII. This is, PII should be concreted with the infrastructure stock increase, which is indeed a broader measure of actions to foster productivity, given all the endowments included in this index. It is also necessary to remark that in these results, the coefficients of the interest variables EF&S and PII are still positive, although the size changed, which regards with the difference in period, 2001-2010.

It was also tested whether the expenditure variables had additional effects given the corruption levels, by adding interaction terms with EF&S and PII. None of them were significant, thus, the results are not reported.

In the column (3) are the results adding the FDI flows. To consider the size of the state, they are measured per employee. Given that this variable is potentially endogenous, it was used the fifth lag in the model. It can be seen that the model is consistent, since the

coefficient and significance of the other variables is similar to the base model. The coefficient of FDI is very small and non-significant. It might be due to the possibility of gains and losses depending on the economic activity, which have been discussed before.

**Table 3.8 Alternative models for states**

Dependent variable: GDP per employee*	(1) Base	(2) Corruption	(3) FDI	(4) Mun_Exp
Infant mortality rate	-0.0254*** (0.0077)	-0.0345*** (0.0076)	-0.0260*** (0.0075)	-0.0216*** (0.0069)
Public Infrastructure stock	0.0015* (0.0008)	0.0030*** (0.0001)	0.0013 (0.0009)	0.0010 (0.0008)
Specialisation	0.4650*** (0.0854)	0.5230*** (0.1328)	0.4009*** (0.0583)	0.4620*** (0.0945)
Ln Market potential	0.4361*** (0.0591)	0.4492*** (0.0328)	0.4407*** (0.0597)	0.4429*** (0.0624)
Ln Federal public investment	0.0586*** (0.0122)	0.0040 (0.0099)	0.0593*** (0.0124)	0.0522*** (0.0118)
Ln Manufacturing employment	0.0361 (0.0460)	-0.0449 (0.0388)	0.0343 (0.0431)	0.0347 (0.0453)
Ln EF&S per employee	0.0036** (0.0016)	0.0500*** (0.0095)	0.0033** (0.0015)	0.0030** (0.0014)
Ln PII per employee	0.0143*** (0.0050)	0.0090** (0.0035)	0.0155*** (0.0051)	0.0142*** (0.0046)
Ln US market potential	-0.1909*** (0.0627)	-0.2212*** (0.0369)	-0.1940*** (0.0626)	-0.2067*** (0.0681)
Ln Corruption		-0.0035*** (0.0008)		
Ln FDI per employee lag5			0.0014 (0.0009)	
Ln Municipal expenditures EF&S				-0.0013 (0.0058)
Ln Municipal expenditures PII				0.0236*** (0.0072)
Obs	406	145	389	406

Standard errors in parentheses  
\* p<0.10 \*\* p<0.05 \*\*\* p<0.01  
\*The number of employees has been taken from the employment surveys undertaken by INEGI, that is, ENE and ENOE.

Finally, in column (4) the expenditures on EF&S and PII per employee from *all* municipalities within the state are added, not only the sample. The results showed opposite signs, that is, negative sign for EF&S and positive for PII. First, the results cannot be expected to be the same, since there are included all municipalities and the dependent variable includes all economic sectors, different to the cities' model. Second, the period is different.

In these results EF&S is biased downwards, compared to the base results. As local governments highly depend on states for investments and firms support, both variables might be related, this is, municipal and state EF&S, causing that the variable for municipalities is not significant. Moreover, if there is promotion and marketing activities, states and municipalities frequently act together. The correlation between these two variables is 0.27. Nevertheless, even if taking out of the models the state level expenditures, municipal expenditures keeps the same sign and EF&S is still not

statistically significant, while PII remains with similar coefficients. This suggests that only the big cities are capable to foster productivity growth through promotion, incentives, firms' support, entrepreneurship training, and all those activities encompassed in EF&S. Meanwhile, investments in infrastructure in *all* municipalities surely affect positively productivity levels.

In spite of the belief that smaller municipalities, especially rural ones, in Mexico are more likely to make inefficient investments and to have higher corruption levels, leading to lesser outcomes out of public investment (Straub, 2008, Moreno, 2013). The investments on public infrastructure showed significant and positive effects over total production per employee. It could regard with higher returns for smaller cities and rural communities. Namely, investments in public infrastructure cause a larger effect on firms productivity if there is less availability, which fails to happen in bigger cities, where larger infrastructure is generally available, and larger investments are required (Dall'erba and Le Gallo, 2008). This could be also related to the results by Moreno (2013), showing that rural governments have improved their management behaviour as a result of the decentralisation in Mexico.

## 7. Conclusions

This paper has contributed to assess the actual effects of local and regional resources spent on economic policies over productivity per employee, as well as the influence of some regional and firms' endowments. For cities and MA, it was found that in total and for domestic firms EF&S has positive effects over productivity growth. Meanwhile it showed a negative sign, and sometimes it was non-significant for foreign firms. It should be remarked that these expenditures are usually aimed at domestic firms, thus it is sensible to find positive effects over national firms. In consequence, it can be said that the consultancy given, incentives, subsidies, promotion and other actions to help firms directly proved to be effective to boost productivity, although foreign firms were not that benefited. Such results could be in line with the report of the World Bank on its *Doing Business* in 2014, stating that municipal governments have improved their services for firms.

Investments in public infrastructure are more certainly related to productivity, yet the correlation is negative in all cases. It suggests corruption or inefficient investment projects. Still, when using the 5<sup>th</sup> lag, it is shown that within the period of 5 years, the investment have had positive effects over productivity growth, for both, domestic and foreign firms,

except for the manufacturing sector. Given the type of investment, it is natural to expect that the exerted resources have a direct effect over firms' productivity after some years. It gives a good perspective for investments in the mid and longer terms. Furthermore, once the infrastructure is improved, especially at state level, productivity is fostered.

In addition, the results also showed that not only big municipalities, but also small ones can promote productivity increases. More importantly, municipal administrations actually enhance aggregate productivity by means of PII. Given the sign of this variable in the model for municipalities, the result indicates that PII in smaller cities and rural areas can effectively boost productivity, contrary to big cities and MA.

Expenditures exercised by states administrations showed always positive effects, but their coefficients were sometimes smaller than in the municipal models. Furthermore, in the alternative model with PII of total municipalities and states together, the former showed the double elasticity than states PII. More importantly, federal physical investment influence on productivity is even larger, about five times the size of PII in the baseline results.

In sum, those results show that local expenditures could also deliver effective infrastructure, although its positive effects could be transferred to the mid and long terms depending on the area and economic sectors, while although smaller, states expenditures always enhance productivity growth. Yet it is the federal government which influences to a greater scope. Not only because of the larger amount of resources available, but perhaps due to better planning, management and administration.

One of the most significant results of this paper is the role of corruption, which was revealed as an essential determinant of productivity. In this alternative model, the government corruption index exhibited a coefficient of similar size than federal investment. Its influence cannot be ignored, since its negative effect can cancel some other benefits of policies implemented. Namely, if firms usually have to pay for bribes at different government levels, and they have frequent issues while dealing with public offices, whichever other benefits received are wiped out.

Competition among domestic and foreign firms is also revealed. The higher productivity of foreign/domestic firms, the smaller productivity increases of domestic/foreign firms. The average coefficient is smaller for domestic firms and in case of manufacturing firms, the

coefficient is even smaller, the size is one digit to the right compared to total firms. It is due to the different effects across manufacturing firms, namely, probable positive vertical backward spillovers, while negative horizontal spillovers, as reported by Jordaan (2008a). For foreign firms, the coefficients were also similar, that is, larger for total firms, compared to manufacturing.

In this way, it was confirmed that in the aggregate, highly productive domestic firms negatively affect foreign firms, and vice versa. Yet the potential losses are larger for foreign firms. This could be due to the existence of competition rather than cooperation. Competition in trade and other services is more natural. Yet, for manufacturing there would have been expected higher benefits when domestic firms in the city are more productive. In other words, national firms are more likely to benefit from highly productive foreign firms, than foreign firms from domestic. Surely the effects differ in diverse economic activities, yet the general results showed larger significance of this “competition” for foreign firms. This might not regard with fierce competition in the final markets, for instance, but competition for economic resources.

This paper also contributed to fill the lack of information regarding to local and state governments means to foster private firms’ productivity. In spite of the disaggregation levels, and data problems the models showed consistency.

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## Chapter 4

### **Bottom-up or top-down policies to boost investment in Mexico? The cases of Mexicali and Hermosillo**

#### *Abstract*

Decentralisation in favour of sub national economies has been undertaken in OECD countries, and it has been recommended to Latin America in order to diminish territorial inequalities. Reactions towards these processes vary a lot and rely in local developments. The present work depicts the institutional changes and policies implemented in two northern cities, Mexicali and Hermosillo, which allowed them to achieve higher income growth than national average and development of high-technology industries. Sixteen interviews were undertaken, 9 in Hermosillo and 7 in Mexicali, in order to find out the level of engagement from the government and the types of policies followed. In Mexicali the proactivity of local actors to generate long-term policies -differently to most Mexican municipalities-, as well as the joint efforts from the three government levels, entrepreneurs, and the universities, have transformed the city from a trade-based city to a highly competitive industrial city. Differently, Hermosillo leadership came from the state government using federal resources to concede economic incentives. The efforts have been focused to one firm namely, Ford Motor Company. This allowed to city to become one of the most successful in the country by 2010. Long-term planning, as well as the coordination and proactivity from private and public sectors seemed to be the key for both case studies. Three main conclusions are drawn from here. First, even when local grounded policies have been advised to municipalities, state and federal governments may act as more effective leaders for economic growth. Second, Mexican municipalities must find their ways to overcome the political cycle and engage in long-term planning to assure certainty for domestic and foreign investors, which will also increase effectiveness in expenditures. Third, local governments can play a significant role in easing business and fostering investments by diminishing bureaucracy and boosting state and federal investments, rather than by providing incentives to firms.

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## 1. Introduction

In the last two decades, given the decentralisation process undertaken in Mexico, municipalities and states have gain political and economic power to actively compete for new investments attraction. Mexicali and Hermosillo are among the most successful cities in the country in this period, yet, their path is divergent. Mexicali showed high engagement from local actors, while Hermosillo exhibited the prevalence of the previous models in which state and federal governments take the leadership to promote investment. In view of that context, this paper seeks to depict the strategy follow by Mexicali and Hermosillo to exploit their geographic advantageous position to increase their regional income, based on FDI attraction.

Even when most institutions are the same within the country, the organisation of local institutions can vary a lot across the country. Finding the political organisation and specific policies followed, as well as the intervention of different government institutions, is simply impossible by getting documental information. Therefore, in order to find out the strategies followed and their implementation, sixteen interviews were applied to local stakeholders; 7 in Mexicali and 9 in Hermosillo. The sample includes entrepreneurs representatives; local, state and federal officers of economic development; as well as academic researchers. The interviews were semi-structured, and they lasted about an hour in average.

It was found that some strategies followed are in line with some of the policies advised by the competitiveness and Local Economic Development (LED) literature. In Mexicali the main strategy was to overcome the three year planning existing in most Mexican municipalities, which deters economic growth because of the lack of continuity of policies in the long-term. Differently, in Hermosillo the foremost strategy is based on keeping the Ford plant and convincing the company to increase the production scale rather than moving away. In both cases, the strategies followed were aimed to gain ground in the global production chain.

The interviewees asserted that fiscal and political decentralisation have provided opportunities for local authorities to design policies that have significantly improved the economic performance in their cities. Nonetheless, the participation and support from federal and state levels has been crucial, especially for Hermosillo which indeed has been more successful than Mexicali at least for the period of 2003-2010 (OECD).

On the one side, to some extent these findings discredit the call for the rising of local governments' participation because policies outcomes highly rely on federal and state resources. On the other side, cases such as Mexicali and other municipalities which have opted to follow LED strategies have assured longer term policies and have helped increasing their development; providing evidence that the latter approach is also valid and perhaps more adequate to be widespread (Rodríguez-Pose and Palavicini-Corona, 2013).

The remaining sections of this paper are distributed as follows. Section two discusses the literature about the usefulness of local government policies to diminish territorial disparities and the specific contribution of LED and competitiveness literature about the role of local actors. Section three addresses the decentralisation occurred in Mexico and the redistribution of political power as well as foreign investments. Section four brings some empirical evidence; most of them case studies, about the empowerment of local actors in Mexico. Section five starts addressing the case studies chosen and depicts the motivation and design of the case study. Section six introduces the geographic, economic and social features of Mexicali and Hermosillo. Section seven describes what was found with the interviews about local organisation and changes during the last 25 years. Section eight discusses the differences between the two cities and also weights up the extent to which the policies explained by the interviewees could be the reason for the economic performance of the cities. The final section makes some concluding remarks. It is also important to mention that to facilitate the reading about the policies implemented in each city, and the likely results obtained, there is a box in the annex, see Box 1 in the annex.

## 2. The rising of local governments as a mean for economic development and territorial disparities reduction

### 2.1 Fiscal and political decentralisation

Political and fiscal decentralisation have been encouraged and advised to national authorities with the assumption that the empowerment of subnational governments might

improve economic performance of regions; leading to diminish regional income disparities within countries (Giugale and Webb, 2000, Treasury, 2004). Some theorists claim that decentralisation is by all means good for regional growth and cohesion (Im, 2010). Meanwhile, others assert that decentralisation leads to higher competition within subnational economies, especially if there remains a high dependence on central/federal resources (Chien and Gordon, 2008).

In empirical studies, fiscal decentralisation seems to be related with decreasing regional inequalities in developed countries, but not in developing ones (Rodriguez-Pose and Ezcurra, 2010a, Lessmann, 2009, Im, 2010). It can be derived from the lack of effective compensation systems (Sorens, 2012), as well as inefficiencies in lower government levels due to corruption and mismanagement (Correa Gomes et al., 2013).

Fiscal decentralisation by itself does not allow local governments to achieve their goals and pursue economic development. Local and regional governments need the right channels to exercise and implement their own policies, this is, political decentralisation. Rodriguez-Pose and Ezcurra (2010a) assert that political decentralisation effectively helps to reduce territorial disparities. Meanwhile, fiscal decentralisation has the opposite effect, which in case of developing countries is larger. As a result, the total effect of decentralisation processes is negative. On the contrary, Moreno (2013) showed that in Mexico, at least for rural communities, decentralisation has led efficiency increases in the local management, since major accountability and entrepreneurship attitude have been amplified.

Particularly, decentralisation and democratisation has been a proposed channel to diminish territorial disparities in Latin America (Topal, 2012, Enríquez Villacorta, 2006). Altogether, the implementation of LED policies has been highly advised to these countries as a result of the failure of top-down policies (Tomaney et al., 2010). Several works have provided evidence of successful cases in which bottom-up policies have been implemented substituting the top-down approach, especially when following LED strategies; vindicating and conceding importance to continue the efforts towards fiscal and political decentralisation. Additionally, significant stream of authors have discussed about the advantages of implementing LED strategies as a reaction towards globalisation and the increasing regional disparities within countries. Devolution is a necessary but not sufficient

condition for the existence of LED strategies. The later have certain characteristics which will be described in the following section.

## 2.2 The Local Economic Development (LED) approach and local competitiveness

This section is intended to depict the different elements that have been pointed out as essential to achieve economic development within the theoretical and case studies literature on LED in order to use them as an analysis framework and identify whether the policies implemented in my case studies are in line with these approaches, top-down policies, or if there is a mixture of those. Also, some similarities with local competitiveness literature are emphasised.

Political decentralisation might have the aim of increasing the participation from local actors, achieving long-term success without recurring to external resources such as FDI or top-down policies implementation. Consequently, political decentralisation can also lead to engage in LED strategies, which could be interpreted as a mean of empowerment by local authorities and other key actors.

LED strategies were generated in North countries about 30 years ago to solve local development problems, after they have been strongly recommended to South countries (Rodríguez-Pose and Tijmstra, 2007). Not all the development strategies could be considered LED, but those that have the territory as the target entity rather than economic sectors. Numerous authors have provided definitions of LED, I present here one by the World Bank published at the top of the division's webpage: "The purpose of local economic development (LED) is to build up the economic capacity of a local area to improve its economic future and the quality of life for all. It is a process by which public, business and nongovernmental sector partners work collectively to create better conditions for economic growth and employment generation"<sup>12</sup>. The difference with local competitiveness definition is mainly that LED entails the collective work of locals, while local competitiveness on its various definitions highlight that competitiveness refers basically to increments on the quality of life/wellbeing (Camagni, 2002, Storper, 1997, Porter, 1999) and/or productivity of firms (Porter, 1990, Krugman, 1994, Storper, 1997), without focusing on the source of the actions that lead towards those means.

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<sup>12</sup> Available at <http://www.worldbank.org/urban/local/toolkit/pages/defining-led.htm>

LED approach attempts to find ways for increasing economic development in the territories without focusing in attracting new investment or human capital, nor developing enterprises that could compete in external markets (OECD, 2008). Yet it does not mean that external relationships cannot be exploited. On its side, competitiveness literature emphasises more particularly investment attraction and the capacity of regions to compete in external markets. Lorens et al. (2002) claim that LED is not opposite to competitiveness, but it is the localised part of the competitiveness strategies implemented at the regional and country level, focusing more intensively to internal resources rather than the external ones. Moreover, this is not a protectionist reaction to globalisation, but it is the way to take advantage of the opportunities presented. It is indeed a mean to take the most out of regional, national or supranational policies (Crescenzi and Rodriguez-Pose, 2011).

LED and local competitiveness policies seek goals beyond economic growth, which is emphasised in the main stream of economic literature. LED and competitiveness literature points out aims such as economic development or increments on wellbeing (Kresl and Gappert, 1995, Camagni, 2002, Boshma, 2004). Additionally local specific characteristics namely, social, cultural, historical and institutional aspects are considered as important, even essential, parts of the process, which are disregarded in the neoclassical model (Rodríguez-Pose, 2013). Particularly LED literature stresses the engagement of local actors, public and private, which leads to local led processes belonging to a region and not to a group of individuals, firms or policy-makers (OECD, 1995). More importantly the interaction occurred in each place is considered a key factor to generate and maintain *local* development strategies and competitiveness improvement of places (Lorens et al., 2002, CAF, 2010). This is the particular ways of interactions will produce different outcomes across regions. The outcomes are better if there is good relation between local and external partners as new networking and opportunities could be exploited, leading to the development of local firms (Cheshire and Gordon, 1998). Moreover, the involvement of local private actors in local policies will provide an arena to bring about more people and firms benefited, rather than just few entrepreneurs, which happens often in counties such as Mexico (Topal, 2012).

The literature about LED strategies has increasingly acquired major importance as the bottom-up approach for economic policies has become more popular as an alternative to the top-down approach, given its failure to provide achieve economic development more

evenly between regions within countries as top-down policies are not comprehensive strategies (Tomaney et al., 2010).

Several case studies have been documented in which successful cities and localities have achieved higher economic development, while attaining considerable engagement from local actors, increasing in this way the possibilities to maintain the processes in the medium and long terms (Lorens et al., 2002, OECD, 2008, Palavicini Corona, 2012, Alliance, 2007). The case studies help to understand common features among regions, cities or localities doing well. After those authors the most significant features of successful processes could be summarised as follows:

- Strategic vision, based on the local productive vocations and the definitions of clear targets.
- Actions aimed to increase employment levels as well as to help the enterprises improving their competitiveness.
- Participation from public and private actors.
- Articulation within the local productive system.
- The institutionalisation of the process; in order to give certainty to the policy guidelines and ensure their continuity in the medium and long terms.
- Given that the policies approach is bottom-up, the major autonomy at local level; the major probability of the process to success.

Numerous academics have labelled in different ways the listed features to summarise the essential requirements to achieve economic competitiveness increasing. To a great extent, these features are included within the *soft* –intangible- determinants of competitiveness pointed out by different authors when advising ways to increase regional competitiveness (Malecki, 2004, Begg, 2002, Poot, 2000, Kresl and Balwant, 1999). In other words, these intangible determinants help to build up long-term competitiveness. Various OECD handbooks converge to highlight similar aspects and detail the practical issues of policies implementation.

From the authors, a foremost feature is the institutionalisation of the process, which does not only regard with the institutes, laws and offices created, this is the formal institutions; yet with informal institutions, or institutional arrangements. Namely, the channels of participation and interaction of local stakeholders beyond politicians and entrepreneurs

representatives; namely, ONG's, trade unions, universities, etc. (Potter, 2009). Politicians last only few years in office, while citizens and entrepreneurs are there for life time, consequently, their engagement guarantees a long-term success.

Nowadays it is widely spread the idea that institutions are critical for policies results and they might explain economic growth and development differences across countries. Yet, there is less agreement in the types of efficient institutions that could lead to the best results (Rodríguez-Pose, 2013).

According to Rodríguez-Pose (2013) the quality of institutions can be undermined by poor institutional arrangements and the lack of flexibility for the local actors to interact and react to the circumstances presented. From the empirical literature, Lorens et al. (2002) findings are in line with this assertion. They state that municipal governments need to be strengthened and be able to build up mixed institutions in order to face new responsibilities and give a wider scope for their actions. In a similar way, Rodríguez-Pose (2013) highlights that when decentralisation occurs, it is extremely important the support from well-founded institutions. This feature has been crucial to provide the arena of actions in both case studies.

Other important aspect is the accountability of the locals, namely, higher participation of locals in policymaking helps also to ease accountability. As confirmed by Moreno (2013) the formulation of local policies after decentralisation processes leading to higher engagement of locals has increased accountability and management efficiency in Mexico.

### 3. Decentralisation in Mexico

Centralisation of wealth in few cities of the national urban system is a frequent pattern, especially for developing countries (Storper, 2013). The decentralisation process in Mexico started during the 70's -accelerated in the following decades- had the aim to develop other economic centres in the urban system and deter centralisation to Mexico City, Guadalajara and Monterrey (Casalet, 2000). This process involved actions to develop the transport system, transfer production to medium cities, and increase of administrative independence.

Federal government has gradually increased decentralised funds to states. From 1993 to 2011, the total increment of unconditional transfers to states was 73%, while conditional transfers increased in about 15 times. The latter is due to the decentralisation of education

and health expenditures. These are tagged resources that are mainly distributed based on previous budgets. Yet, incentives are provided through unconditional transfers, because the distribution criteria have been changing over the time. Especially after 2007 they seek to encourage state governments to foster economic growth, increase tax collection, deliver better education, and achieve poverty and deprivation levels reductions (Peña-Ahumada, 2011). Before 2003 there was a general complaint, and some researchers claimed that federal transfers fostered higher regional inequalities favouring wealthy areas (Peña-Ahumada, 2011, Rodriguez-Oreggia and Rodriguez-Pose, 2004, Courchene and Díaz-Cayeros, 2000). However, there is no evidence of the results obtained with the changes introduced in 2007.

During these decades, also democratisation and deep political changes have happened, which led to significant differences in the political geography of the country. The dominant party, PRI started losing power after 1989, and by 1995 it had lost 7% of the states and 45% of municipalities (Costa-I-Font et al., 2003). The economic crisis of 1994 induced a change in people's vote, and by the following presidential elections in 2000, for the first time in Mexican *democracy*, an alternative party won the elections. These political changes also triggered fiscal and political decentralisation in order to prevent boycotts throughout the vertical power relationships when the governors come from different parties, as well as inhibiting Pork-barrel politics to gain votes. In this manner, it became imperative to institutionalise the resources transferred, make clearer the distribution criteria, and leave more autonomy and management capacity to local and regional governments. For instance, Pork-barrel politics have been identified during the period 1990-1995 by Costa-I-Font et al. (2003). Although it could not be asserted that such problems have been totally over; the changes in criteria distribution of federal transfers and the increment of the decentralised funds have helped to reduce such behaviours.

In addition, diverse funds have been created to enhance co-partnerships projects, in which local recipients –citizens or entrepreneurs-, municipal, state and federal government get involved. For instance, through PRONASOL, as well as other regional programs and institutions, with the aim of decreasing poverty, the participation of local citizens in policies design has increased. Micro-regions program is aimed to reduce deprivation in the most deprived municipalities in the country. In such program the proposals of actions should be formulated on behalf of the inhabitants of the regions (Gonzalez-Rodriguez, 2005). *Pueblos Magicos* (magical towns) on its side is intended to enhance tourism as an

alternative economic activity in small municipalities which could be considered quite traditional due to their landscape, food, architecture, historical facts, etc. This programme also requires considerable participation from local citizens.

Likewise, the federal government has established as a priority the support to SME's (Small and Medium Enterprises), and the construction of infrastructure along the bordering cities to increase FDI. Linkages between the private sector, and universities and research centres have been also fostered (Casalet, 2000). Financial resources have been granted to regional projects in science and technology in partnership with the private sector throughout the National Council of Science and Technology (CONACYT).

In sum, throughout this over 3 decades-period, engagement from local stakeholders as well as empowering of local and regional governments have become more certain. As a consequence, local and state governments gained more opportunities and shared responsibilities, to pursue regional development, while federal investment has continued as a significant growth driver for regional income (Rodriguez-Oreggia and Rodriguez-Pose, 2004).

Within this context of economic and political changes, municipalities and states have embarked on different routes to pursue economic growth and boost development; according to their problems, size, economic structure, rural/urban condition or simply the local social composition.

### 3.1 Redistribution of foreign investment and raise of competition

The high centralisation of economic activity and population in few cities, namely, Mexico City-and the centre region, Monterrey and Guadalajara reinforced the concentration of FDI to these cities. The economic liberalisation entailed the transformation of the country, which maximum expression was the North Armenta Free Trade Agreement (NAFTA) signing in 1994, which placed Mexico among the most important receptors of foreign investments among developing countries.

Although Mexico City and the centre region are still the main receptors of FDI, this is about 65% of total FDI from 1994- to 2013, there has been a significant increment of investment towards bordering cities. After the NAFTA signing, foreign firms accelerated the investment to the Mexican bordering cities to supply the US market. Traditionally,

firms that are seeking to supply internal markets and take advantage of the economies of scale, tend to locate in the centre, given the size of market potential; while efficiency-seeking firms locate in the north (Samford and Gómez, 2012).

Even some decades before the NAFTA, due to the Maquiladora program initiated in 1965, the maquiladoras have played a significant role to provide employment in the bordering region (Fuentes, 2009). Altogether, other manufacturing activities have been increasing in the region. Cities such as Saltillo in Coahuila; Hermosillo in Sonora; and Chihuahua in Chihuahua were benefited with the location of automotive firms in the 80's. This fact transformed their economies, bringing considerably larger income than other bordering cities, except for Monterrey in Nuevo Leon.

Nogales in Sonora and Ciudad Juarez in Chihuahua have also received important amounts of FDI, at the beginning with low technology profile firms, such the textiles, and now changed to electronics, computers, machinery and equipment, chemicals, aerospace, and others (Fuentes, 2009). Likewise, in Baja Californian cities, although maquiladoras are still very important, other manufacturing activities have increased in recent years, especially the automotive and aerospace industry.

To illustrate the geographic changes in FDI allocation in the Table 4.11 the total FDI flows, the ranking and share for the top 10 receptors, during the period 1993-2013 are shown. It is clear that Nuevo Leon has captured much more foreign investment than any other bordering state. In fact, it holds the second position in the country just after Mexico City, given that Monterrey has been one of the traditional industrial poles in the country.

**Table 4.11 Total FDI flows to the top 10 states in the period 1993-2013.**

State	Total flows* (USD millions)	Ranking	Share of national total
National	398,862.71		100%
Distrito Federal	222,327.20	1	55.7%
Nuevo León	38,246.64	2	9.6%
Estado de México	21,228.12	3	5.3%
Chihuahua	19,965.71	4	5.0%
Baja California	16,440.65	5	4.1%
Jalisco	12,414.32	6	3.1%
Tamaulipas	7,805.14	7	2.0%
Puebla	7,331.73	8	1.8%
Coahuila de Zaragoza	5,518.92	9	1.4%
Sonora	5,200.45	10	1.3%

\*Source Secretariat of Economy. Department of FDI. This includes flows, reinvestment and debt between firms.

As regards with Baja California and Sonora, the former is within the top five in the country; and even though Sonora received a third of the total investment received by Baja California, it is still among the main FDI receptors in the country. It is also important to remark that given the centralised urban systems, big proportions of this investment goes to the biggest cities, those are, Tijuana and Mexicali in Baja California and Hermosillo and Nogales in Sonora.

Nevertheless, even with larger amounts of FDI to bordering states, it is clear that the concentration to states in the centre, such as Distrito Federal, Estado de Mexico, and Puebla remains. While Jalisco located in the occident region, is also high in importance.

Undoubtedly, attracting foreign investment is one of the most important targets for local and regional governments in Mexico due to the possibility of technology transfers, employment creation, income increase and the multiplier effect over the local economy. Especially because many cities have increased their income as FDI launches. Bordering states seek to attract FDI not only because of the significant business opportunities, but in some sense is a mandatory; they must strive to take out the most of their advantageous geographic localisation, the no one else in the world has. More importantly, effects on income levels are clear. Jensen and Rosas (2007) showed that FDI helped to diminish the existing gaps in regional income across Mexicans regions during 1990-2000.

For these reasons, there has been political competition to be favoured by federal government, and to be promoted as a receptor of FDI projects. Even when in recent years state governments could exert major influence on investment attraction since they also have resources to offer incentives, attend firms' needs and improve competitive advantages. The support from federal government could be also vastly influential because the most important incentives are given by the federal administration, which mainly favours automotive and aerospace industries, since they have been declared as national priority. As a result, should states and municipalities want to attract and retain foreign investors, they should strive to increase local competitiveness in the long-term, given that *short-term attractiveness* achieved by incentives, is not a secure nor a sustainable way towards economic growth, and it is not even under their full control.

Still incentives-competition on behalf of local and state governments is becoming more common. Targeted promotion, diverse incentives, exemptions of local taxes, free land, and

labour force training, as well as the construction of specific infrastructure are among the most frequent offers made by state government to compete. Indeed, the interviewees asserted that competition is quite intense, even if bidding wars by offering millions of dollars on behalf of state or municipal governments is not feasible.

For instance, BMW announced the intentions to open a new plant in Latin America, yet the place remained undefined for a while. First, this led to the competition between Brazil and Mexico. Different statements regarding to the final decision were published in the press<sup>13</sup>. In addition, it raised competition between Mexican states, which offered incentives packages that are not public. Among the competitors were Guanajuato, Querétaro, San Luis Potosí and Hidalgo (Franco, 2014). Then, the competitors were narrowed to San Luis Potosi and Hidalgo (Cremer, 2014). The final decision was revealed on July this year, the winner is San Luis Potosi, located in the centre region (Alper, 2014). The governor said that they were in talks for over 5 years. It entails that during that time there was a significant bargaining process between Brazilian and Mexican local, regional and federal offices for investment promotion. It surely comprised expenses in order to fulfil the firm requirements, and place the best bid; not only by the winner, but by all the other competitors. This might have been costly for public administrations; meanwhile the firm took the most out of it.

In this way, the creation of municipal and state especial departments or agencies to promote investment, the increasing expenditures on such policies and public infrastructure on behalf of local and regional governments, is to some extent justified given that some others will be also competing for capitals. The expenses with this aim have increased up to 1.5 times from 1993 till 2011, in case of the municipalities, and up to 5 times in case of states.

In order to increase policy efficiency and get out better outcomes, given the major competitive environment, the planning for each government term and the implementation of some performance indicators have been also widely spread, as it has been documented by various researchers (González Rivas, 2014, Moreno, 2013, Rodríguez-Pose and Palavicini-Corona, 2013).

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<sup>13</sup> <http://www.reuters.com/article/2014/05/18/us-bmw-mexico-idUSBREA4H03O20140518>. <http://www.maquilaportal.com/index.php/blog/show/BMW-denies-new-plant-will-be-built-in-Mexico.html>

Likewise, the accountability of the implementation of policies based on thoughtful analysis of the region needs, as well as the assessment of their goals, have been also launched by INEGI by means of the project called Government Census. In this way, it can be said that decentralisation and economic liberalisation has definitively increase empowerment of local and regional government. As a result, the competition at the city level has also increased.

#### 4. Empirical evidence of empowerment of local and regional actors in Mexico

As mentioned before, Mexican cities and states have different potential for taking advantage of decentralisation and effectively undertake bottom-up policies responding to local needs. Bigger cities, especially the state capitals, are usually in the best position, while rural areas might be in rears.

There have been several cases in which can be exemplified the transition from the prevalence of top-down policies to bottom-up approaches. The key actors in the process are diverse, for instance, leadership can be from local/state public officers, leadership on behalf of entrepreneurs; and wider participation of local stakeholders. Though, to be more precise, the leadership usually entailed a mixture of the above. Still, there are other municipalities in which in spite of the participation from local actors, there could be vast influence of upper government levels, especially with pecuniary resources. It involves not only the availability of funds, but also the rapid answer to be provided, that could also determine the outcomes of the plans to a great extent.

Topal (2013) documents the three cases of empowerment of local/regional actors to face political, social and economic changes occurred with the decentralisation, economic liberalisation and democratisation in Mexico. The places are the state of Tabasco, and the cities of Chihuahua in Chihuahua, and Acapulco in Guerrero. The raising of local leadership took different patterns, and the leaders came from different sectors; state-institutions, entrepreneurs and organisations of local peasants, respectively.

In Tabasco, given the oil boom, the leaders of the state-own firm PEMEX strived to retain major amount of resources within the state administration. This cannot be taken as a bottom-up policy, yet in this case regional authorities endeavoured to retain benefits of oil in the state facing the federal government.

In case of Chihuahua, the leadership comes from the entrepreneurs. Given the short terms in office at the municipal level -3 years-, it is frequent the lack of continuity in public policies. With the aim of overcoming this problem in 1991 Chihuahua City created an office for local economic development that could implement policies in the long-term, this office is called DESEC. Given the decentralisation ongoing, local businessmen found the right channel to promote the city and gain ground in the global market towards the Twenty-first century, which is indeed the name of the whole project (Topal, 2012) .

The process occurred in Chihuahua might have been a precedent for Mexicali to carry on similar policies and create an akin office in 1993. Other significant similarity with Mexicali is the political context. Both states have had important presence of PAN party, in which entrepreneurs' presence and leadership is very important. Therefore, business-men have become municipal presidents, and have got involved with public positions. Indeed, according to Samford and Gomez (2012) being governed by PAN makes a difference in terms of FDI attraction, that is, states with PAN governors tend to undertake policies for attracting firms seeking to exploit competitive advantages. On the other hand, it could be a result of pork barrel politics during the PAN governing period in the national presidency 2000-2012.

In Acapulco, organisations of local entrepreneurs' have fought against foreign investors. Acapulco is one of the most important touristic destinations in Mexico, and it attracted foreign investors as a result. Almost 80% of foreign investment in Guerrero state from 1999 to 2013 is concentrated in economic activities related to tourism. This has led to a conflict owing to the competition, and the displacement of local entrepreneurs by foreign firms. Hence, the local peasants have fought against multinationals. They were supported by the leftist party PRD to strengthen their power and open political and social spaces for local entrepreneurs. It raised violence, but the peasants kept spaces for their business. This could be a cause for the significant decreasing of foreign investment to the state, together with high crime and violence levels in recent years.

Other cases in which bottom-up policies were implemented are Nueva Vizcaya in Chihuahua and the surrounding region of Guadalajara in Jalisco state. The highlight is that the engagement from local stakeholders made the difference. The initiatives began with local the ideas of local actors and largely relied on their actions. Of course, coordinated and supported by public officers from municipal, state and federal governments.

Nueva Vizcaya is a region in state of Chihuahua, the region encompasses 21 Municipalities. Their main economic activity was the mining, but when mines were closed the whole region fall into a significant depression. According to Lorens et al. (2002), the participation from the university in order to build bottom-up policies was the key in their success.

In Jalisco, the production is highly centralised in the Metropolitan Area (MA) of Guadalajara, causing significant territorial disparities within the state that are difficult to overcome. Given the economies of scale, market size, urban amenities and some other benefits, Guadalajara is a traditional destination of domestic and foreign investment, which is accumulative, recursive, and practically irreversible. In consequence, the local stakeholders in the state, especially local entrepreneurs, participated to make a plan for diminishing the regional disparities, by taking advantage of the closeness of Guadalajara instead of competing with it (Lorens et al., 2002). They developed services to firms and agro industrial activities; as a result of such combination they also were able to attract FDI. The participation from stakeholders, the political decentralisation from the state government, and the consulting with citizens are among the most remarkable features of the process (Ruiz D., 2000).

Palavicini-Corona (2012) compares two cities, Apizacac and Chiautempan in Tlaxcala state, where tradition of communal organisation is present. Due to the indigenous traditions, citizens are organised and actively participate in public decisions. Indeed, it is the only state in the country in which two systems work in parallel; that is, political parties and traditional communitarian channels. Apizacac appears as one of the municipalities with more LED policies applied during the period of study 1990-2005 among a sample of 800 municipalities. Although Apizacac and Chiautempan showed significant increase in human development, it was larger in Apizacac. According to the author, it is related with to the major presence of LED policies. It is worth noting that there has been significant coordination of local actors with the state and federal government to attract new investment, especially FDI. In this way their strategies are supported by the external links, based on high internal social capital. Owing to their strategic position, near to the biggest market in the country, Mexico City, they already had a significant advantage, magnified by the local participation.

Different to most works on evaluation of bottom-up policies that largely rely on case studies, Rodriguez-pose and Palavicini-Corona (2013) present an index to account for the number of LED strategies applied in more than 800 municipalities. The index is then used as an independent variable in an empirical model which tests its effects on human development. Among the LED strategies are considered the following range: whether the municipal plan is based on a diagnosis of the local economy and public policy adhere environmental considerations; the existence of policies to foster entrepreneurship and mechanisms in which private, public, and social sectors engage in public matters; whether there is cooperation/coordination with external parties of diverse nature, that is, public or private actors. It was found that municipalities engaging more importantly with LED such those listed, have improved their human development faster during 1990-2005.

## 5. Motivation and design of the case study

As explained through section three and four, local and regional administrations in Mexico have considerably increased their empowerment by means of fiscal and political decentralisation. The effects of the increasing expenditures with the aim of co-participate to enhance investment and productivity growth can be assessed with empirical econometrics, which is part of the interest of this author in recent works. Nevertheless, it does not allow assessing the influence of local environments, neither the particular types of policies implemented.

Besides, as pointed by Castells (1999), Florida (2003) and other researchers, cities are entities in which public and private individuals can be understood as a flow, their economic and social performance thus yields from local interactions that should not be neglected but explored.

Hermosillo has been a dynamic industrial city due to the presence of Ford Company since 1986. However, during the 1993-2003 its average production growth was negative, according to the Economic Censuses. It later achieved high growth rates from 2003 to 2008. Its industrial production increased in more than 100% within those 5 years, and it is now one of the most successful cities in the country. This path is interesting; its performance is different from other cities in the region and the state.

Mexicali on the contrary, used to be a trade-based economy 20 years ago. In addition, Tijuana is an important competitor for the city. It is the most important city in population and production within the state. It has a longer tradition of entrepreneurship and cooperates with one of the biggest economies in the world, that is, San Diego, California. Hence Tijuana constitutes an important competitor in economic and political terms, especially the political support from state government is essential.

In spite of such close competitor and some other disadvantages, such as the weather and scarcity of skilled labour force, high-technology industry has landed in Mexicali. The city is now considered one of the most competitive in the country according to the last report of the Mexican Institute for Competitiveness (IMCO) in 2012 and previous indexes such as Sobrino (2006).

Mexicali and Hermosillo are similar in population and economic structure. Both cities are important recipients of FDI, and produce a considerable share of total Mexican exports. Among the most important exporting industries are the electronics in Mexicali, and the automotive in Hermosillo. Also, in Mexicali the aerospace had been considerably growing in recent years as it will be analysed later. In sum, it can be said that both are among the most successful in the country.

Consequently, this study is motivated to find out whether their economic performance relied in local actions and to what extent the fiscal and political decentralisation have changed their position to pursue economic development. Given their advantageous geographic position, both cities are likely to attract foreign investment, yet, more specific incentives and working ways cannot be found in documental research.

Fieldwork at those cities has been undertaken to get first-hand information on the institutional changes occurred. Sixteen semi-structured interviews were carried out, 7 in Mexicali and 9 in Hermosillo. The goal was to obtain information on the type of policies to enhance economic growth undertaken at the local level, getting the point of views of different groups; those are public officers, private representatives, and academics. The interviews lasted from one to three hours, depending on the representative time. The interviews were semi-structured and the central questions can be consulted in the annex Box 2. Additionally, lot of information came across given the freedom of interviewees to answer. Also, some of them provided documents and websites where complementary

information was found. Furthermore economic and social indicators have been used, which come from national data bases of INEGI.

Coordination and cooperation with upper government offices can be essential when launching local policies and investment attraction. According to the documental research, there should be different channels to access funds and to ease governments' management. Nonetheless, in a highly political environment and with the likely presence of pork barrel politics, it is also important to find to what extent political decentralisation allows local governments to effectively push their own policies and support local firms. Furthermore, bargaining from economic sectors or power encounters among key actors could also lead to delay in policies and could even increase their implementation costs. Therefore, the interviews served as an instrument to get to know the way key actors interrelate within the city as well as with upper administration spheres.

Among the interviewees are the representatives of the local and foreign manufacturing firms; the authorities of local and state economics departments; the regional representative of ProMexico in Hermosillo, which is the federal department for foreign investment promotion; and one academic researcher in each city. In case of public officers, the aim of the questionnaire was getting to know the policies being implemented to foster economic growth in the city. As for private representatives, the questions had the goal of knowing the kind of support received from the government, the bargaining process, as well as the main problems in the sector. Given that both cities are highly specialised to the industrial sector and most of incentives programs target for foreign firms, only the representatives from both, the foreign and the national industries, were interviewed.

From the academics, it was intended to have the opinion from experimented researchers in the region about the policies implemented and the possible reasons for success or defeat of such policies. Unfortunately, only two researchers accepted to attend the interview, one in each city. Still, both researchers have been working and living in the city for more than 15 years. In consequence, their contribution was very valuable to have a long-term view less biased, since they are not directly involved in politics. It is important to remark that given the different institutional organisation, the officers and representatives contacted do not correspond to the exact counterpart in the other city. The full listing of people and the organisation they represent is in the annex.

The interviews undertaken are limited yet very rich. They allowed getting information on public policies, bargaining processes, and the ongoing social framework. In addition, the information provided has been verified and completed with documents provided by public officers, newspapers, official publication and official databases. All together helped drawing relations with the outcomes achieved in these cities

## 6. Features of Mexicali and Hermosillo.

### 6.1 Geographic location and population

Mexicali and Hermosillo are situated in the US-bordering region of Mexico. Mexicali is one of the most important US-bordering cities. Hermosillo is about three hour drive from the nearest bordering city, that is, Nogales in Sonora. Nonetheless, its geographic position can be considered advantageous for firms willing to sell their products in the US. Both cities have a near harbour, which is also important in terms of transport means, especially for the Automotive and Aerospace industries, existing in both cities. The nearest harbour from Hermosillo is Guaymas, about one hour-and a half drive; the nearest from Mexicali is Ensenada, situated about three hour drive.

Mexicali City, is considered a metropolitan area, and in the 2010 census it had 936, 826 inhabitants, while Hermosillo had 715, 061 inhabitants. Both cities are the political capital in their State, Mexicali in Baja California and Hermosillo in Sonora. It is important to highlight that the capital generally concentrates major production and population, yet in Baja California, Tijuana has remained as the most important economic and population centre.

### 6.2 Economic growth

In this section, growth ratios and the production levels are discussed. Given the context of economic transformations, many cities in the bordering region are in similar position to seek investments and improve their position in the national game. Therefore, some indicators are compared to other cities located in the US-bordering states, as well as to other cities in the OECD countries in order to provide a reference point. It is important to mention that the statistics at municipal level are difficult to find. Some information is not available for long-term periods, or it is not updated often. Therefore, although the

interviews were undertaken during December 2012 and January 2013, the information presented here varies in dates.

Data on economic product is only available every five years, which is when the Economic Censuses were carried on, that is in 1993, 1998, 2003 and 2008. For production indicator it is used the Total Gross Production<sup>14</sup> –TGP- in the municipality. It is necessary to clarify that most Mexican municipalities have at least a small proportion of agriculture, and other commodities production due to the geographic inclusion of rural areas. Intending to account only for the cities' production primary economic activities, mining and electricity have been excluded when adding the total.

The raking of the database on 264 metropolitan areas from the OECD is also discussed (OECD). The data does not match exactly with the data used from Economic Census because the OECD has implemented its own methodology and definition of metropolitan areas, and it estimates GDP. Yet, given that the same methodology is used for all countries, it is comparable and it has the advantage of yearly availability from 2003 to 2010 for Mexican cities.

To begin with, economic growth rates for total and per capita product are shown in table 4.2. The rates are estimated using two different sources, the OECD and the INEGI. As mentioned before, the periods are not the same, and they are not comparable given the methodology employed. In case of the Economic Censuses from INEGI, the annual average growth rates are estimated per period. Meanwhile, for the OECD data, the rate is estimated for the whole period, that is 2003-2010.

According to the Economic Censuses, both cities achieved similar annual rates in total TGP for the whole period –column 4-. Nevertheless, Hermosillo showed dramatic decreasing rates during 10 years from 1993 to 2003 –column 2 and 3-. And after that, the recovering of the economy has been impressive. Mexicali also showed negative growth during 1998-2003, although it was less severe than Hermosillo. It recovered the following period, yet with much lower rates than Hermosillo.

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<sup>14</sup> In Spanish: *Producción Bruta Total*, this is not comparable with GDP from the National Accounts, owing to the methodology. Source: Economic Census, various years.

In the OECD data, the annual average growth rate of total GDP is much smaller for Mexicali –column 5-. Indeed, after 2008 Mexicali showed negative growth of the total GDP, with a year average of -2.8% in 2008-2010 years. Still, its period average was higher than Tijuana, the biggest economy in the state. Meanwhile, Hermosillo was the 4<sup>th</sup> in the country, by this indicator.

As regard with TGP per capita, both cities showed negative growth when accounting for the period 1993-2008 –column 9-. This could be explained by high immigration rates to the bordering cities, which causes that even if the total production grows, the per capita average does not (Calderón and Martínez, 2005). Nevertheless, according to INEGI, the decrement was smaller in Mexicali –column 9-. Once more, Hermosillo showed bad performance during 10 years and a big recovery after 2003. Within the same period most bordering cities showed positive total TGP growth during 1993-2008, yet very few increase their income per capita as well. It is worth noting that according to OECD data most Mexican cities showed negative GDP per capita growth after 2008, which is highly related to the US crisis that also affected Mexican economy. Hermosillo grew in almost 1% per year when accounting for the whole period –column 10-.

**Table 4.12 Annual average growth rates per period, for total production and production per capita**

City	Total Gross Production					Total Gross Production per capita				
	INEGI**				OECD*	INEGI**				OECD*
	1993-1998	1998-2003	2003-2008	1993-2008	2003-2010	1993-1998	1998-2003	2003-2008	1993-2008	2003-2010
<b>National average</b>	2.93%	2.47%	3.66%	3.02%	2.42%	<b>1.37%</b>	<b>1.19%</b>	<b>2.73%</b>	<b>1.76%</b>	1.02%
<b>Mexicali</b>	2.43%	-2.71%	5.61%	1.72%	0.80%	0.09%	-3.96%	2.93%	-0.43%	-1.90%
<b>Hermosillo</b>	-2.63%	-5.76%	15.13%	1.85%	3.50%	-4.45%	-6.69%	10.18%	-0.71%	0.90%

Source: INEGI, Economic Census. OECD Regions and Cities. Metropolitan areas.

\*Gross Domestic Product  
 \*\*Total Gross Product

To give an idea of the income per capita of the cities, the levels published by the OECD are discussed and compared to the rest of the MA. In 2003 Hermosillo GDP per capita was \$20, 644 USD, and occupied the 212<sup>th</sup> place compared to other 264 metropolitan areas within the OECD countries. It was below other Mexican cities such as Chihuahua -192<sup>th</sup>-, Monterrey -198<sup>th</sup>-, Centro -204<sup>th</sup>- and Saltillo -208<sup>th</sup>. Yet, it was over the country average of Check Republic, Hungary, Estonia and Poland.

By 2010 Hermosillo GDP per capita was \$21, 932 USD, and it occupied the 211<sup>th</sup> position. It was above the country average of Portugal, Slovak Republic, Hungary, Poland and

Chile. Compared to other Mexican cities it was just below Centro<sup>15</sup> with \$35, 142.48 USD, at 106<sup>st</sup> place; and Monterrey with \$23, 887.98 USD, at 204<sup>th</sup>. It improved its relative position to Chihuahua -212<sup>th</sup>-, Saltillo -219<sup>th</sup>-, and Tijuana -254<sup>th</sup>-. This indicates that during those 7 years, it increased its GDP per capita more than most cities in the country.

In 2003 Mexicali's GDP per capita was \$14, 504 USD, it occupied the place 240<sup>th</sup> of the total ranking, and it was in position 16<sup>th</sup> compared to the 34 Mexican cities. By 2010 the GDP per capita was \$12, 715.87 USD and occupied the 253<sup>th</sup>. In fact, compared to the rest of Mexican cities, it fell down 7 positions, but it was above other bordering cities such as Tijuana -254<sup>th</sup>-, Reynosa -256<sup>th</sup>- and Juarez -258<sup>th</sup>-. Even after this reduction, Mexicali GDP per capita was over the Mexican average (\$12, 010 USD), and other cities such as Valparaiso y Concepcion. Still, in 2010 its GDP per capita represented about 30% of the Hermosillo's. In sum, according to the OECD data, Hermosillo had been one of the most successful Mexican cities in economic performance, while Mexicali had been above the national average and other cities in the state, yet behind other bordering cities.

### 6.3 Economic structure

Hermosillo relies to a large extent on the automotive and metallic products, which has increased its importance through the years. In the table 4.3 the contribution by economic activities to the TGP per city are shown. The industrial activities are disaggregated.

The production grouped in sub-sector 38 is highlighted, since it refers to the automotive, aerospace, and some electronics production. In Mexicali by 1993 the 38 contributed with only 12.7% of TGP, while trade was 55.7%. By 2008 the 38 share of TGP was 36.6% and trade diminished until 15.5%. In Hermosillo by 2008 more than 50% of its production came from the 38 industry.

Beyond its relative contribution to the municipal TGP, the manufacturing production of Mexicali compared to the national product has significantly increased. In 1993 Mexicali used to contribute with only 0.15% of total manufacturing production in the country, while Hermosillo contributed with 1.35%. In 2008 given the increments of the 38 sub-sector, Mexicali increased its share to 1.01%, and Hermosillo to 1.58%. in addition, from the total

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<sup>15</sup> Centro GDP per capita is well above the average of other Mexican cities, given the oil production.

manufacturing production in Mexicali from 1993 to 2008 the 56% was produced by firms with foreign investment, while a similar share was shown in Hermosillo, with 43%.

**Table 4.3 Contribution to the Total Gross Production per economic activity.**

Code	Activity	1993		1998		2003		2008	
		Mexicali	Hermosillo	Mexicali	Hermosillo	Mexicali	Hermosillo	Mexicali	Hermosillo
31	Food, beverages and tobacco	8.0%	8.4%	11.8%	7.4%	10.4%	14.7%	10.8%	9.1%
32	Textiles, clothing and leather industries	0.4%	1.0%	1.5%	1.7%	0.6%	0.8%	0.7%	0.5%
33	Industries of wood and wood products. Includes furniture	0.5%	0.3%	0.1%	0.1%	0.0%	0.1%	0.0%	0.1%
34	Paper and paper products, printing and publishing	2.6%	0.9%	3.8%	0.6%	4.7%	0.6%	5.1%	0.3%
35	Chemical substances, products derived from the oil and from the coal, from rubber and plastic	3.0%	1.2%	2.8%	3.3%	3.0%	2.4%	2.7%	5.7%
36	Non-metallic mineral products, excluding petroleum and coal products	4.1%	3.9%	4.6%	5.0%	4.5%	7.4%	4.5%	4.0%
37	Metallic basic industries	0.6%	0.0%	3.4%	0.0%	4.3%	0.1%	3.7%	0.0%
38	Metal products, machinery, and equipment. Includes surgical and precision instruments	<b>12.7%</b>	<b>32.5%</b>	<b>34.6%</b>	<b>50.0%</b>	<b>35.0%</b>	<b>32.4%</b>	<b>36.3%</b>	<b>56.0%</b>
39	Other manufacturing industries	0.0%	0.0%	5.1%	0.4%	2.1%	0.4%	3.6%	0.2%
82	Services of rent and administration of real estate and Services of rent of personal property	1.1%	0.5%	1.3%	1.3%	2.5%	3.3%	1.5%	1.1%
61-62	Trade	55.7%	43.5%	20.8%	20.9%	20.5%	23.5%	15.4%	12.9%
91-97	Other services*	11.2%	7.8%	10.3%	9.2%	12.4%	14.5%	15.7%	10.2%

\*Includes: Letting and administration services of real estate and Letting services of personal property; Educational, research, medical, social assistance and partnership services; Restaurants and hotels; Recreational, cultural, recreational and sports services; Professional, technical, specialised, and personal services (includes loans to enterprises); Other services except Government activities.

In Hermosillo within the sub-sector 38, apart from Ford's production and its supply chain, it also accounts for other items such as computers and electronic devices, but they contribute with less than 8%. Therefore, it could be said that Ford plant and its related industries directly produced about 22% of Hermosillo's TGP in 1993 and 40% in 2008. Certainly, according to the local interviewees, Ford plant brought a completely different economic dynamism into the city. Even though, when it was opened in 1986 the technology level of the processes undertaken was relatively low, compared to the current plant. Nowadays, Ford plant in Hermosillo is one of the most efficient and with highest technology among all Ford's.

Given such high dependence on the automotive, any shock to the industry and the company, considerably affects Hermosillo. According to the local authorities and entrepreneurs, around 1998 or even before, there were some rumours of Ford closing down. One explanation could be the reduction in market share by Ford company, as well as efficiency losses (Contreras et. Al, 2010). In consequence, the expectative from investors were not any good. This considerably affected the new investments undertaken in those

years. Nonetheless, by 2002 Ford announced the new investment from 2003 onwards. This could be the most determinant reason for the TGP contraction from 1993 to 2003, and impressive recovery after 2003, with an industrial production growth of more than 100% in total from 2003 to 2008, which is also in line with the good results according to the OECD data.

In addition, it has been documented the presence of significant spillovers from Ford Company to local SME's firms. Contreras (2010) finds that there have been mainly three channels: 1. knowledge acquired by engineers that were former employees, and have become suppliers. 2. The socio-professional networks and market relations. The higher presence of local intensive suppliers and their professional interactions, allows other firms to get technological transfers. 3. Vertical backward spillovers. That is, the transfer process in which the transnational helps to their suppliers to improve their efficiency given the benefits obtained. Hence, this might have fostered a very competitive environment, with tacit knowledge, that is, specific to the region increasing its *stickiness* in words of Cheshire and Magrini (2009); which reduced Ford's cost and increased its global competitiveness (Contreras et. al 2010).

In Mexicali, the automotive production is less important; sub-sector 38 is mainly constituted by electronics devices as well as computers. Nevertheless, it is important to mention the increasing importance of the aerospace. In 1998 the aerospace contributed only with 2% of total manufacturing production in Mexicali. Yet, it was the 98% of the total production in the country, whereas the other 2% was localised in Tijuana. By 2003 Chihuahua City produced the highest production share in the country -46.36%- within this industry. This is shown in table 4.4. Also, in that year Saltillo as well as some other cities with less importance had also started to contribute to the industry.

The aerospace production changed its geography, and by 2008 it had been distributed to other cities, most of them in bordering states. Definitely, state and municipal governments realised that the aerospace was a new opportunity to bring high technology industry to their cities, instead of textiles and electronics. Therefore, it seems to be a competition among some cities to attract more companies, but also to constitute an aerospace cluster. Local officials also talked about this competition, because Mexicali is no longer the main producer in the country.

Stakeholders in Mexicali have strived to consolidate this industry since it is more profitable than the automotive and the electronics, owing to the high technology profile. Indeed, according to the office for investment attraction and marketing at the federal level, ProMexico<sup>16</sup>, currently the aerospace in Mexicali and Tijuana are specialised to provide services with high value added called Knowledge Process Outsourcing (KPO) not only to the aerospace but also for defence. Besides, according to the FEMIA (2012), the most developed cluster in the Mexican aerospace industry is the existing in Tijuana and Mexicali.

**Table 4.4 Contribution to the national aerospace industry per city 2003 and 2008.**

State	City	Region	2003	2008
<b>CHIHUAHUA</b>	CHIHUAHUA	Bordering State	46.36%	18.84%
<b>BAJA CALIFORNIA</b>	MEXICALI	Bordering State	32.55%	12.39%
<b>COAHUILA DE ZARAGOZA</b>	SALTILLO	Bordering State	11.39%	11.04%
<b>BAJA CALIFORNIA</b>	TIJUANA	Bordering State	6.16%	4.12%
<b>YUCATÁN</b>	MÉRIDA	South	1.29%	1.11%
<b>SAN LUIS POTOSÍ</b>	SAN LUIS POTOSÍ	Centre	1.18%	0.86%
<b>SONORA</b>	EMPALME	Bordering State	0.14%	4.19%
<b>QUERÉTARO</b>	COLÓN	Centre	0.00%	14.56%
<b>SONORA</b>	GUAYMAS	Bordering State	0.00%	12.87%
<b>NUEVO LEÓN</b>	SANTA CATARINA	Bordering State	0.00%	9.82%
<b>QUERÉTARO</b>	EL MARQUÉS	Centre	0.00%	8.47%
<b>SONORA</b>	NOGALES	Bordering State	0.00%	0.95%
<b>SONORA</b>	CAJEME	Bordering State	0.00%	0.42%
<b>CHIHUAHUA</b>	JUÁREZ	Bordering State	0.00%	0.32%
<b>SINALOA</b>	CULIACÁN	North	0.00%	0.02%
<b>DISTRITO FEDERAL</b>	MIGUEL HIDALGO	Centre	0.00%	0.01%
<b>DURANGO</b>	DURANGO	North	0.00%	0.00%
<b>HIDALGO</b>	TEPEAPULCO	Centre	0.00%	0.00%

Given that the aerospace is classified as a high technology industry, it has been defined as a national priority. In 2007 it was created the Mexican Federation of Aerospace Industry (Federación Mexicana de la Industria Aeroespacial; FEMIA) with the aim to organise and improve the competitiveness of the industry in the country. In the same year, it was created the Mexican Council for Aerospace training (Consejo Mexicano de Educación Aeroespacial; COMEA) in order to coordinate with educational centres and universities to create professionals and technical carriers to prepare qualified labour force with the required skills within the sector. Especial attention has been given from the federal government to develop this industry. The clusters are being developed to produce different parts of the aircrafts across the country and lot of opportunities have been identified within the global production chain in the industry (FEMIA, 2012).

Nowadays in Hermosillo the aerospace have also started, unfortunately the data on production is not available. Yet according to FEMIA (2012), the importance of its cluster

<sup>16</sup> Source: [http://promexico.gob.mx/en\\_mx/promexico/Aeroespacial](http://promexico.gob.mx/en_mx/promexico/Aeroespacial)

is intensifying. The state government is working to gather more enterprises within this industry to ensure the consolidation of the cluster, in order to be able to make a whole turbine in Guaymas, and stop importing the components. Some firms have been encouraged to settle in Hermosillo given that Guaymas is a small city -113, 000 inhabitants in 2010-, thus its capacity to growth is limited. Nonetheless, the most important industry in Hermosillo is still the automotive, especially because Ford has continued increasing the investment in the city. For instance, on March 2012 it was announced a new investment for 1,370 USD millions. It might be as a result of the significant incentives received, for instance, for the period 2011-2013 Ford Motor Company in Hermosillo and Chihuahua has received about 10% of the total incentives granted by ProMexico.

#### 6.4 Social conditions and wellbeing

In this subsection, given the availability of information, some data is presented at state level. First, it is important to remark that bordering states have low poverty levels. According to the National Council for the Evaluation of Social Development Policies (Consejo Nacional de Evaluacion de la Politica de Desarrollo Social; CONEVAL), although after the 2008 crisis, the percentage of poor people increased in most states, in Baja California and Sonora the people in extreme poverty diminished. CONEVAL presents a group of indicators to measure poverty conditions of population. By 2012 in both states, people leaving in extreme poverty were about 5%, while the country average was 11%. Furthermore, it is worth noting that 65% of Sonora inhabitants have access to social security, 45% in Baja California and 39% is the country average. This is a hint of the wider presence of formal firms providing social security to their employees.

Meanwhile, Baja California has major coverage of basic housing services, 95% vs. 88% in Sonora, and 79% in Mexico. One reason for lower percentages in Sonora is the big land extension, and lot of small rural communities, which makes difficult to provide basic services. Although this information is at the state level, it helps to give an idea of the social context regarding to wellbeing conditions.

Concerning with the education level of the population, in 2010 Hermosillo had 10.4 average years of schooling for population over 15 years, while Mexicali had 9.6. The national average was 8.6. In other words, the Mexican average individual does not even complete secondary education. While in these municipalities, have at least one more year

of education. There are other municipalities with higher average, such as Benito Juarez delegation in Mexico DF with 13.5, and San Pedro Garza, Nuevo Leon with 12.1. The lower averages were in rural areas in Oaxaca with just 2 years.

Some municipal data is presented in the table 4.5, allowing for comparisons over the time. First, as another indicator for education, it is the share of matriculated students in medium-high and professional education over the total working population. According to Cheshire and Magrini (2009), high shares would indicate higher education levels of those entering to the labour market. Also, it could indicate that the city have high enough salaries to sustain lot of economic inactive population. It can be observed that although both municipalities increased the average years of schooling, the indicator proposed by Cheshire and Magrini has diminished over the time, while the country average increased. One possible reason would be immigration of working population to these municipalities, from which a high proportion holds a degree, decreasing the ratio students/working population.

From the Economic Censuses, it has been calculated the average remuneration to working population. It includes all expenses paid to social security. Both municipal averages are higher than the national. Yet, averages have diminished considerably, 26% in Mexicali and 22% in Hermosillo, while the national average increased.

For infrastructure indicator<sup>17</sup>, it has been built an indicator for the most important metropolitan areas in the country. Given the scarcity of data on physical endowments in municipalities, most researchers use number of landlines, or number of hospital beds. I have built an indicator comprising several endowments per capita, listed in the table notes. Given that it has been used to compare those cities, no average at the country level is presented. In this indicator Mexicali is above than Hermosillo, which is due to the higher number of Km of roads per municipality area in Km<sup>2</sup>, which according to IMCO, this is the best competitive advantage of Mexicali.

The infant mortality rate shows better conditions than the national average. This might be also related to larger access to social security and basic housing services, and low deprivation levels. The deprivation index in 2010 published by the National Council for Population (Consejo Nacional de Poblacion; CONAPO), placed Mexicali in position 2405 out of 2456 municipalities. That is, there were 51 municipalities with lower indexes. While

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<sup>17</sup> This is the variable used in the other two chapters.

Hermosillo had an index slightly lower, staying in position 2410, only 5 places higher than Mexicali. Both indexes are considered very low according to CONAPO standards.

**Table 4.5 Wellbeing indicators**

Variable	Mexicali		Hermosillo		National average	
	1993	2008	1993	2008	1993	2008
<b>Share of matriculated students in medium-high and professional education over working population</b>	0.34	0.31	0.50	0.37	0.10	0.13
<b>Average wage (MXN)*</b>	\$72.61	\$53.51	\$58.44	\$45.61	\$38.92	\$53.37
<b>Infant mortality rate</b>	17.7	13.06	18.5	12.29	30.40	15.2
<b>Infrastructure**</b>	35.36	28.90	31.73	26.41	-	-
*Total remunerations over total working population Economic Census (MXN thousands per worker in a year). Corresponds to 1998. Primary activities and mining is not accounted.						
** This an index built for urban municipalities includes: per inhabitant number of sewage, water feeds and electrical power supply. In addition, number of flight passengers and km of roads by area. Source: Own calculations with various INEGI databases.						

In sum, the health conditions as well as the schooling years for population over 15 years old are higher than the national average. Nevertheless, the wages showed a decreasing trend. Contrary to what should be expected given the higher technology profile of jobs in some industries. In some indicators Mexicali seems to be better than Hermosillo, and vice versa. It cannot be said that one showed considerably better living conditions than the other. Even in deprivation indexes, they showed similar positions, and they are among the best in the country.

In addition, according to some national competitiveness indexes, both cities are qualified as very competitive with good social conditions (Sobrinho, 2006). In the last publication of the competitiveness index by IMCO in 2012<sup>18</sup>, for the total index Mexicali was in position 10<sup>th</sup> and Hermosillo 12<sup>th</sup> out of 77 cities. The most outstanding feature for Hermosillo was the social conditions Hermosillo in which it was in 3<sup>rd</sup> position out of 100 cities. For Mexicali, the best qualification was obtained regarding to infrastructure, in line with the results showed by the index in Table 4..

## 7. Changes in local policies towards 21st century.

This section contains the information obtained out of the interviews. Based on them, this section depicts the local framework, good practices and policies implemented that are outstanding different from other municipalities in the country, which might have influenced on their economic performance.

<sup>18</sup> Consulted in June 2014, available at: <http://porciudad.comparadondevives.org/ciudades/3>

A box with a synthesis of the most outstanding actions undertaken in response to local problems and its related results is in Box 1 of the annex.

## 7.1 Mexicali

As mentioned before, given the three-year political term in Mexican municipalities, it is hard to have long-term planning at this level. However, in order to implement policies that increase competitive capacities, there is a need of long-term planning, since improvements cannot be achieved within three years periods.

Moreover, it is frequent that most public servants and officials change each term, which entails high training costs and uncertainty for private investors. According to the World Bank, as part of the project Enterprise Surveys 2006<sup>19</sup> and 2010<sup>20</sup>, one of the most important problems identified by the firms in Mexico was the uncertainty in policies. Likewise, the representative from the maquiladora sector in Mexicali, Mr. Mario Martija, asserted that firms do not need incentives from governments, since they might represent very little proportion from their income. Instead, it is more useful to have certainty in fiscal and economic policy, because every year they have problems with fiscal policies, and every starting term, there is uncertainty in policies continuation, especially at the federal level. It is also frequent the uncertainty with local policies, nonetheless in Mexicali the plan has been consented and most stakeholders know it, helping to reduce this uncertainty.

Mexicali created a council for economic development that is public-private, and has a defined plan to follow until 2020. Such council is called CDEM, that is, Council for the Economic Development of Mexicali (Consejo de Desarrollo Económico de Mexicali). As documented by Topal (2012, 2013) there is a foregoing institute in Chihuahua with similar structure, called DESEC.

CDEM was created in 1993, and 5 years later Tijuana created a similar institute, which was also followed by the other municipalities in the state. CDEM is directed by entrepreneurs; nevertheless, on its direction board are included public and private representatives. Among them are the municipal president, the undersecretary for economic development of the state

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<sup>19</sup> Available at:

<http://www.enterprisesurveys.org/~media/FDPKM/EnterpriseSurveys/Documents/Profiles/English/mexico-2010.pdf>

<sup>20</sup> Available at:

<http://www.enterprisesurveys.org/~media/GIAWB/EnterpriseSurveys/Documents/Profiles/English/mexico-2010.pdf>

–that is from the Secretariat of Economy, in the state-, the representative from the Business Coordinating Committee (Consejo Coordinador Empresarial; CCE), as well as other representatives from the federal government, and the delegates in charge of the projects undertaken. It is also important to mention that the previous municipal president is part of the direction board, to also make sure there is continuity in policies implementation.

As regards with the delegates, they have to be CDEM members and they need to pay a fee, depending on their income. Such structure, similar to DESEC in Chihuahua City, might allow entrepreneurs to gain power and make policies only to their favour. However, the president Rene Acuña assured citizens contribute even when they might not get directly benefited, in sake of Mexicali's higher development in the long-term.

Such statement, though should be pondered, it cannot be expected that citizens would invest money if they do not get something out of it. And in fact, some groups will be underrepresented. On the other side, this open and diverse participation non-existing somewhere else, is also likely to increase resistance among public and private representatives, which might lead to less concentration of benefits in few hands. The social conditions existent in Mexicali validate that benefits are spread to a good extent.

The main purpose of CDEM is formulating local policies for the long-term. The president of the institute interviewed remained about 13 years in the position, and he has now been removed. He highlighted that he had been working together with the same people in different positions, which allowed them to keep the same plan and achieve the goals they settled around 2000, when the plan *Mexicali 2020* was started. To do this plan, the council evaluated the socioeconomic status of Mexicali and, based on its weaknesses and strengths, formulated a plan for the following 20 years, and it was settled as a law. They visualised their objectives as a city and planned what needed to be done in order to reach those objectives. The working committees are based on the main needs identified at that time. A new plan for 2050 is underway, and big labour to get citizens aware and involved is being undertaken.

According to the CDEM there have been some disagreements with politicians due to some divergent opinions. However, CDEM is already consolidated as the leader and it has great influence on policymaking and good relationship with the public officers from all levels, since they represent a general vision rather than the needs from one industry or

entrepreneurial group. This was also confirmed by Mr. Guillermo Chacon, the secretary of the municipal president, since the municipal administration does not attend any economic planning, but local services to citizens. For instance, Mario Martija, the representative from the National Chamber of Transformation Industry (Camara Nacional de la Industria de la Transformacion; CANACINTRA), and Francisco Rodriguez, the representative from CCE (Business Coordinating Committee), expressed different points of view about the best policies to be followed. To some extent they can influence, but no change the policies, since CDEM follows objectives previously settled.

As a bordering city, Mexicali could attract immigrant labour force that is just waiting to go to the US, generating a problem of high staff rotation within enterprises, lowering the competitiveness of local labour force.

When Mexicali 2020 plan was formulated, it was identified that the labour force was one very weak point in the city, given the high turnover and emigration of people. In consequence, public officials endeavoured to develop social capital in the city. There have been created cartoons characters to promote values in working population, as well as to inform people about the best achievements of the city, in order to foster proud and attachment. Among the values promoted is personal growth, that is, to continue studying to be promoted within the firm; which is highly supported by firms. By these means, they strived to create an environment in which the people commit more with their work and somehow get aware of the good results the city has attained, but especially that the city competitiveness relies on their work.

Nowadays, all authorities and entrepreneurs representatives agreed that the local labour force is so committed with their work, and have better skills. For instance, Honeywell director assured that Mexicali's labour force is one of the most productive and efficient amongst their world employees. Additionally, a plan to sell Mexicali to the externals and increase pride has been running on behalf of CDEM, according to them this has increased the efficiency and commitment of labour force. This is indeed critical to build up social capital (OECD, 1995).

As regards with the universities and education centres, one of the most important programs developed by CDEM is the commission for "linking firms & schools." In 2000, CDEM also realised that there was a generalised complaint on behalf of the private sector that the

research being undertaken at the universities was useless for them. Furthermore, the qualification of labour force was not according to the firms' needs. In consequence, CDEM started working to diminish this gap. As a result, the local universities have changed some courses, and increased the technical training on machines used by firms. Finally, owing to the increasing demand for some technical skills, in 2009 some new professional carriers were opened. That is, Bioengineer, Aerospace Engineer, Engineer on Renewable Energy, and Engineer in Semiconductors and Microelectronics. Besides, CDEM started running adverts to encourage young people to do any kind of engineer studies rather than the traditional ones such as law, business administration, and informatics, which were the carriers with higher enrolment by 2000. In that year, 15-18% of total university students were enrolled to engineering careers, and this share went up to 31% by 2009.

Moreover, among the decentralisation policies, innovation in regional research centres and within firms had been highly encouraged by different means, such as funds from the National Council for Science and Technology, CONACYT. Among the requirements to get the funds is to include students on the projects. As a result, there is an increasing participation from students, and research centres in applied research that is narrowed to attend the demands from the private sector. Namely, the Honeywell president in Mexico, affirmed that Honeywell is a successful case of innovation in which due to the research undertaken in the firm supported by the CONACYT, the firm would improve the design of Boeings and Bombardiers. All the designs are done in Mexicali, by Mexican engineers<sup>21</sup>. This confirms might indicate the existence of a local environment that is difficult to replicate anywhere else, increasing the attachment of firms, in this case, Honeywell, to the city.

Other particular feature of Mexicali is that the office in charge to promote the city, and attract and/or retain investment -especially foreign- is financed half from the private sector and half from the public money. It is called Industrial Development Commission (Comision de Desarrollo Industrial; CDI). Given that they finance part of the expenditures, local entrepreneurs ensure higher efficiency with the resources spent. The economic activities to be encouraged are clearly defined, entrepreneurs closely supervise that the resources are spent only in attracting firms within the economic activities set as priority. They identify the firms that need to be attracted in order to complement production chains.

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<sup>21</sup> Innovation forum 2010. <http://tijuanainnovadora2010.wordpress.com/2010/10/13/conferencia-casos-de-exito-de-conacyt-en-tijuana-y-b-c/>

Furthermore, frequently a group of entrepreneurs travel together with the people from the commission, in order to face the prospect investors with the entrepreneurs who would become their business associates. Also, industrial-parks builders participate in the promotion of the city providing specific infrastructure capabilities, and thus playing an essential role for investment attraction.

With regard to with incentives from the local level, the secretary of the municipal president stressed the scarcity of resources. He pointed that there are few possible ways to spur economic growth unless lobbying for state and federal resources. They cannot do a lot even with the untagged resources, thus they have to seek the financial support from upper levels to undertake projects. This is the mean to support CDEM and CDI efforts. In addition, municipal governments usually offer exemptions on construction permissions and land use, which can reach up to \$20 USD per employees, very low compared to upper government levels.

It is noticeable that most of attention is focused to foreign firms. And although they have significant role for regional income, local firms should be also attended. According to, CANACINTRA, and CCE the programs to give incentives to local firms are not helpful enough. The paperwork to access such incentives is problematic, and it may take even a year. As a result, even when firms take the time to go for it, they may receive the incentive after one year. Besides, CANACINTRA estimated that the cost of administrative work for domestic firms may represent up to 30% of their income, given the requirements from governments. Hence, firms do not ask for cash incentives, since they are not representative of their total cost. They want to have simpler rules and make governments attend the general sector problems, such as electricity costs, or shortcuts. This is, in fact in line with the results obtained by the World Bank surveys, mentioned before, and the results by Salgado Banda and Bernal Verdugo (2011) showing that poor electricity supply in Mexico hampers productivity of manufacturing firms.

Furthermore, the maquiladoras are allowed to import without paying taxes, which fosters buying inputs outside the country. National entrepreneurs demand governments to enhance that foreigners buy national inputs, which may lead to local spillovers (Smarzynska Javorcik, 2004). Yet, according to the maquiladoras representative, Mr. Mauricio Rivas from AMMAC it might hamper their competitiveness. Successful business might occur

when ex-workers in foreign firms have become suppliers. Nevertheless, this has not been frequent, which might indicate low spillovers effects by this mean.

Differently to Tijuana, the cross-bordering cooperation in Mexicali is not that important, but only about the water theme. Furthermore, it does not coordinate greatly with Tijuana, thus Mexicali performance has been achieved by attracting foreign investment, while strengthening their labour force and infrastructure endowments. According to Dr. Noe Fuentes, Tijuana has the advantage of an older business class that is more organised, risk takers and it is working together with the US. The business opportunities they have due to their close relation with San Diego are more profitable owing to the production size of California. On the contrary, Mexicali has been working almost alone, with little coordination with the cross-border partners. Besides, Tijuana economic structure is similar, which also intensifies competition and hampers the investments flows to Mexicali.

In sum, among the most outstanding characteristics of Mexicali is the crucial role played by local entrepreneurs to spur economic growth; the long-term vision; the institutionalisation of the general plan; and public officers and entrepreneurs' representatives working on their positions for longer periods, decoupling policies of the political cycle to a good extent. Also, according to the interviewees, the fact that some public officers used to be entrepreneurs representatives and have been involved in the plan *Mexicali 2020* during several years, helped to have better understanding about the needs from the private sector.

Finally, it can be said that Mexicali has implemented some of the policies listed before in section 2.2, such as long term visioning, the participation from public and private sectors, and the institutionalisation of the process by means of the CDEM and CDI structures, giving special empowerment to CDEM by making a law the general plan formulated. The formal and informal institutions allowed Mexicali to make more efficient plans with higher accountability as recommended by Lorens et al. (2002) and Rodríguez-Pose (2013). Moreover, Mexicali strived to specialise in few industrial activities as recommended by various academics (Johansson, 2000, Kresl and Balwant, 1999, Potter, 2009), and they also attempted to improve strategic determinants of competitiveness.

## 7.2 Hermosillo

In Hermosillo, local authorities have also realised the need to become active participants to foster economic growth, given the fierce competition for mobile capitals. Especially since China became less competitive, on labour force costs.

The participation from local entrepreneurs has been less active than in Mexicali. The entrepreneurs with better bargaining position are the foreigners, although they are not well organised. The Association of Maquiladoras is still young, it was funded only 6 years ago, it did not have a website and getting information about it was difficult. The interviewee, Mr. Jesus Gamez, is a former president because it was hard to find the current. The lack of organisation compared to their counterparts in Mexicali or Nogales, was remarked by Mr. Jesus. Given the dominance of few entrepreneurs and their economic importance, shown before, they have huge bargaining position and bargain by their self with the local authorities. In other cities entrepreneurs bargain together and get better results; yet good efforts are being undertaken to act as a group, but high resistance is found.

The policymaking structure followed by the municipality has been the same as the national trend, namely, with plans for every political term and limited continuity, owing to the differences among parties. Nonetheless, with the aim of promoting the state and targeting investments, in 1997 the state government created a promotion office, that is the Council for Economic Promotion of Sonora (Consejo Para la Promocion Economica de Sonora; COPRESO). It is part of the Secretariat of Economy of Sonora. In 2000 higher autonomy was granted to COPRESO in order to make its own plans, and its own budget was designated. Still, since COPRESO is an extension of the Secretariat of Economy, its plan is defined every 6 years, together with the state government, as well as its president.

COPRESO has been working in a similar way than the CDI in Mexicali. That is, based on the needs expressed by entrepreneurs already settled, specific firms are targeted in order to attract them for completing supply chains, increasing efficiency in production processes, and reducing transports cost. They have a wide range in the kind of incentives given to the foreign firms.

One frequent complaint from enterprises is the lack of technical training taught at universities and educational institutions. Therefore, one of the most important incentives given is the employees training funding. COPRESO hires teachers and, with the

machines provided by enterprises, teach the management of them. Also, CANACINTRA has *CANACINTRA University*, which name is given to training courses offered by CANACINTRA opened just on demand.

In addition, owing to the standards and certification required to be part of the supply chain for the automotive and the aerospace, COPRESON also offer grants to pay such licences. Moreover, given Hermosillo disadvantage in geographic location, compared to other bordering cities; COPRESON also provide consulting on transports logistics, to find out the best transport means for firms' production.

It is important to highlight that, COPRESON director is removed each political term with the state governor, yet some public servants have been there for longer periods to keep continuity when attending firms, and lower training costs. The employees are designated to attend or approach to specific firms to complete the attraction, settlement and follow up. The relationship is kept in the long term. COPRESON director highlighted that, given their targeted incentives packages, their intervention prevented Ford plant closing. Instead, they decided to re-invest, which was announced by 2002, and more recently by 2012. If as suggested by Contreras (2010) the reasons regards with competitiveness, Mexican authorities are subsidizing inefficiencies, yet Ford closing would have been a disaster for the city.

To attend domestic firms, the municipal government created the Municipal Bureau for Economic Promotion (Comision de Fomento Economico del Municipio de Hermosillo) in 1997. The director of the Bureau is also renewed every three years, and it is designated by the municipal president. Yet, there are some public servants that have remained for longer. Namely, the interviewees, Veronica Yanez Cordova had more than 6 years of experience, they showed deep knowledge and enthusiasm with the whole project, while the director had just started when the fieldwork was undertaken, and showed little familiarity with the project.

The bureau works with domestic firms, mainly SME's, helping with the paperwork, training on administrative topics, and facilitating loans with lower interest rates than banks. One of its main targets is to reduce the opening time for an enterprise, by means of simplifying the paperwork and creating a "one stop shop." The bureau was recognized by the World Bank project Doing Business in 2009 for being the second fastest office to

approve construction permits. Furthermore, it is important to remark that according to the representatives interviewed, the project from the World Bank has fostered competition among local Bureaus for economic development, in order to facilitate doing business in Mexico. On the word of the last report, Mexico reduced the average time to open new business from 58 days in 2004, to 7 in 2014.

Concerning to fiscal incentives, depending on the case, there could be granted from 25% to 100% exemptions on some local taxes such as land property; transfer of ownership of real estate; construction license and land use permit; safety advice and occupation in civil protection.

As said by the undersecretary Mr. Lorenzo Galvan, the Secretariat of Economy of the state gives emphasis to help local firms developing marketing, branding and merchandising, especially for the agro industry. This is linked to the Research Centre for Food and Development –CIAD-. It produces nutritional tables and researches to increase products fresh-life when possible, which is partially financed by the Secretariat.

The creation of the offices at state and municipal administrations seems to be congruent with the time in which the economy could have started to recover. Yet, the leadership comes from state administration, with federal resources given through ProMexico. Still, the support to SME's and efforts towards easing paperwork for domestic firms are solid and are in line with LED strategies given that their aim is to increase employment and economic growth for locals.

In sum, in Hermosillo the state has implemented competition strategies pursuing foreign investment increases, by targeting firms and offering specific incentives, in line with top-down approaches. Nevertheless, the work carried out by the Municipal Bureau for Economic Development, could be considered within the strategic determinants by pointed out Kresl (1995) given that they have the aim to simplify bureaucracy; as well as within LED strategies since they attempt to increase employment. The efforts to support SME's are similar to those undertaken in other cities, that is, helping the access to loans and training, which is actually a policy guidelines from federal government.

Finally, the political cycle still has a larger influence on policymaking, and the local policies still lack of long-term visioning. For instance, the formal institutions do not allow enough flexibility for local policies given the dependence on higher state-government

plans and the political arrangements come through it. In addition, it seems that the managers or owners from big entrepreneurs have very good bargaining position, while the domestic firms do not have big chances at this matter. For instance, CANACINTRA representative, Octavio Sanchez, showed higher engagement in the work made by COPRESON with foreign or big firms, rather than with the needs of the domestic industry. In consequence, although the policies are focused to increase employment and economic growth rates, it is heavily targeted on one sector, in line with traditional development policies rather than LED strategies, thus, it can be said that less LED components are found in Hermosillo case.

## 8. Discussion. Competition strategies and the participation of local actors

Both cities have found their way toward specialisation by targeting firms within few economic activities with high value added. As pointed out by various authors within the competitiveness literature, specialisation might be the best competition strategy to gain ground in the production chain in the globalised economy (Johansson, 2000, Capello and Camagni, 2005, Kresl and Gappert, 1995). Still, when the city is highly dependent on one economic activity, especially in one firm such the case of Hermosillo; it is risky to fall into an economic depression when such firm is in crisis. Competing for foreign investors has been the main strategy from both cities. Nevertheless, according to the information published by ProMexico, more incentives have been granted to Ford Motor Company Hermosillo, than to other companies located in Mexicali, at least in the period published.

Both cities have increased their participation to pursue better economic performance. Mexicali has taken advantage and designed its own growth plans, with a great extent of independency even from the state government, increasing flexibility and accountability, highlighted before as advantages of LED policies. Nevertheless, perhaps the lower growth rates in Mexicali can be also explained by the few support from federal and state governments in this case. Meanwhile the income per capita in Hermosillo is vastly greater, with high economic growth rates and benefits from state support and federal incentives to its firm constituting its main economic basis.

In Mexicali other institutions such as the CCE, and CANACINTRA showed high engagement with planning activities, and ideas about better paths. There was a proposal document published by CCE. This is not harmful for planning, quite the opposite, it has

been very beneficial, since it is noticed an environment in which local stakeholders intensively participate and give opinions, fostering consented decisions, rather than deterministic plans produced by fewer people.

Differently, in Hermosillo the most determinant actions had been undertaken to keep the automotive and provide incentives to it. The incentives are much targeted and there are no wider efforts to increase labour force skills, but only those specific to firms, failing to a traditional sectorial development approach. On the other side, Hermosillo population has higher schooling level, thus this is not a concern for the authorities. Also its industry is more solid and attracts more skilled labour force; by 2010 29% of immigrants had superior education, vs. 20% in Mexicali.

However, Sonora provides more support to SME's. In Mexicali, CANACINTRA, CCE and CDI representatives, discussed about the incentives and support given to SME's. It seemed less continuous, and systematised, however. In Mexicali most efforts are being carried out by the regional office of the Secretariat of Economy at the federal level.

As regards with expenditures on economic policies, there are significant differences. In spite of scarce resources available in the municipal administrations, the more they spend, the more they might be able to get from state and federal administrations. Especially regarding to infrastructure construction, which is a shared responsibility. In 1993, their expenditures per capita used to be similar. In that year Hermosillo spent about 25% more than Mexicali and the quantities varies through the period. Nonetheless, the differences started to be bigger after 2008, and by 2012 Hermosillo spent about the double amount per capita than Mexicali, which might have also influenced its better economic performance in recent years.

Meanwhile, in Mexicali, in spite of the less financial support, and its close competitor, the institutional framework has been determinant to transform the economic profile. Higher growth could be achieved if the domestic firms receive more attention. Perhaps larger spillovers such as those documented in Hermosillo are just matter of time. For instance, enterprises founded by former employees in foreign firms were highlighted by the AMMAC representative in Mexicali, but those are still limited. This is what is called by Contreras et al, (2010) market-professional spillovers, which might increase later when there is more abundance of foreign entrepreneurs, as documented in Hermosillo.

In sum, within the context of fiscal and political decentralisation, it is clear that in both cities significant efforts have been undertaken to attend local problems. Even whether they seek for the support from upper government levels, the initiatives to call the attention to their particular problems have played a significant role. Furthermore, the greater engagement from local/state stakeholders seems to be contemporaneous with those decentralisation policies depicted in the second section, especially after 2000.

Nevertheless, the representative from CCE in Mexicali remarked that more political decentralisation is needed. Since decision making is still highly centralised and there is no a constant channel to communicate the legal framework and policies needed locally. Particularly, deputies do not visit often the state; hence they cannot recognize local problems and their priorities differ. For instance, the Especial Economic Zone project, which might enhance trade relations with San Diego, California, has been frozen for more than 3 years now, because federal deputies have other themes as priority.

## 9. Conclusions

Mexican municipalities have ever more shared responsibilities to pursue economic growth. The institutional framework has been changed, demanding more proactivity from local administrations. Better performance is rewarded with federal-states investments and sometimes with federal transfers. That is, there are more resources given to administrations with higher economic growth, and tax collections.

Nevertheless, such decentralised resources are still insufficient and municipalities need to get more resources from state and federal administrations, preventing the presence of Pork-barrel politics and diminish the effects of differences among parties. Municipalities should be able to undertake big infrastructure projects or to give significant incentives that can actually matter for firms, rather than only grant local taxes exemptions. As pointed out by Thomas (2013), local administrations, especially in non-wealthy places, tend to give exemptions rather than cash incentives.

In this context, the fieldwork undertaken researched on economic performance and institutional framework in two cities located in the northwest region of Mexico. In the case of Hermosillo, more than a development strategy with long-term visioning, the policies followed are quite traditional as they have been focused to maintain the Ford Motor Company and attract the aerospace industry, while the main actor is the state office

COPRESON. Its success is greatly based on targeted incentives and financial support from the federal government, in a more traditional top-down approach. Still, the local and state offices, coordinated with CIAD, support domestic firms, which is more systematic and solid than in Mexicali. Furthermore, the local Bureau for Economic Development in Hermosillo even got an award due to its management, and they showed themselves very committed with the *Doing Business* project. These actions are in line with the LED strategies, this is, to strengthen local entrepreneurship, increase local employment and create an institutional framework that can take advantage of the decentralisation. In this case, those institutes providing bureaucratic and financial support for firms are taking advantage of the national decentralisation policies. The total outcome of these policies is that Hermosillo is one of the most successful cities in the country. Particularly after 2003 according to competitiveness indexes, INEGI data, as well as the OECD.

Mexicali conditions used to be very different in 1993 when its development council, CDEM, was created. The most significant actions started some years later, about 2000, when the plan for 2020 was formulated. It shows the resistance occurred at the local level, to have an agency like this. That is, it took about 7 years to get things functioning and define a long-term plan. In fact, a similar plan has been published for the state, which to some extent was inspired in the Mexicali plan. Such plan was still a draft by December 2013. It should be highlighted that the plan Mexicali 2020 was based on a thoughtful assessment of the city and clear objectives were defined. That allows evaluating the outcomes per committees and following up in the long term, which is not usual in Mexico.

The local networking in Mexicali between entrepreneurs, public officers and entrepreneurs' representatives was very clear while undertaking the fieldwork, which is one of the keys in Mexicali's success. The greater engagement from local stakeholders seems to be in line with those decentralisation policies depicted in the second section, especially after 2000. Nevertheless, the policies are importantly focused to foreign firms, which prevent enhancing local entrepreneurship which might assure better economic development in the long term. As said by Dr. Noe Fuentes, the businessmen are inexperienced, thus Mexicali stakeholders have endeavoured to increase labour force skills but no entrepreneurship. Mexicali economic growth has become less dynamic, especially after 2008. Meanwhile, the local actions combined with state and federal support allowed Hermosillo to remain as one of the biggest economies in the border, and the third highest GDP per capita in the country, according to the OECD. This indicates that the lack of

support and lesser relationship with the state and federal administrations have a significant impact in Mexicali situation. Still, as pointed out before, some actions are in line with LED strategies, this is long-term vision, employment creation, social capital enhancement, and institutionalisation of the process that is actually in charge of non-government people, but local entrepreneurs, with high participation from different sectors as well as the universities.

In sum, from the two cases documented, the results cast doubts over the development model to be enhanced. The model of Mexicali has led to a positive but limited economic growth, with little support for domestic firms, even though the transformation of the city has been significant. Mexicali initial conditions were more similar to other Mexican cities and its model of long-term planning, continuity of policies and systematic evaluation could be highly advised, since it would greatly diminish the cost of political cycles. Unfortunately, foreign investment is likely to continue flowing mainly to the bordering region, to the centre region, and to some touristic destinations. These results are in line to those cases documented by Palavicini-Corona (2012) in which engagement from local stakeholders were a key for success, but their economic growth yields upon foreign investment owing to their geographic location –Tlaxcala, near Mexico City- allows that. Other cities cannot thus follow the same path, but similar initiatives to take advantage of decentralised resources and to create long-term plans base on local needs and potentialities aiming local development not only investment attraction.

Hermosillo on its part is highly dependent upon one firm, that is, Ford Motor Company. Still, there are larger spillovers documented (Contreras et al., 2010), and the local entrepreneurs receive more attention from the municipal officers, at least in paperwork, which should be encouraged in other cities. Nevertheless, its high GDP growth rates are mostly due to the economic incentives received by the Automotive, granted by federal and state governments, going back to the top-down economic model. Such model should not be followed, as it fosters regional inequalities.

In consequence, there have been identified practices that could be more recommended than others. Undoubtedly greater engagement from local stakeholders, that is, public and private representatives, citizens and universities leads to long-term improvements of economic development. However, economic growth will be boosted only if there is enough support from upper government levels. It does not mean that they should provide huge amounts of

money, but definitively municipalities benefit from their backing. That is absolutely a daily basis relationship and engagement, in words of the different local officer and businessmen representatives, which conclusively increase the potential outcomes of local policies; namely, political support. Exploitation of external investors cannot be guaranteed for all cities, thus not all cities might achieve fast economic growth, yet local economic and social conditions would be definitively improved with maintenance of bottom-up policies, without exacerbation of regional disparities.

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## Chapter 5

### Conclusions

#### 1. Introduction

There are no rules about the way of writing a conclusion chapter. This one does not seek to repeat the aims and a conclusion of each chapter given along the whole dissertation, because I think it is repetitive. I rather tried to remark further discussion that can be achieved once the whole project is revised. This chapter also identifies some limitations and stress policy implications.

#### 2. Concluding remarks of each chapter

When putting together all the findings it is possible to make a broader analysis of the whole empirical and qualitative work. In the second chapter, the empirical model allowed finding different investment drivers, in terms of regional features and public policies implemented. In spite of the fewer resources available in municipalities, it was clear their influence on private investment growth. Moreover, it was also showed that manufacturing firms seek for different amenities, as well as the foreign firms.

The US market potential variable showed that foreign investment will continue growing in the bordering area given the proximity to the US, which may fosters exacerbation of inequalities. Thus, other regions of Mexico should try to support domestic firms and enhance their growth, rather than focus on external investors.

As regards with competition, the correlations found vary a lot, depending on the group of firms analysed, and the field of competition, that is, geographic or by economic specialisation. When the cities spend more than their competitors in public infrastructure, the effects of competition for all firms, this includes both, geographic and economic specialisation variables. Meanwhile, spending on Economic Fostering and Subsidies showed positive correlation for geographic variable, while it was not significant for economic specialisation. It is interesting that when estimations are separated into domestic and foreign-joint venture firms, competition variables are more important for the later groups. Nevertheless, the variables are not statistically significant all times, which reveals limited capacity to influence on investment decisions by competition. In other words, if

governments starts spending more than their geographic or economic partners, this is not likely to have significant influence on firms decisions.

This little influence shows that Mexican cities cannot actually engage in competition, or perhaps they are not even aware of it. It is most likely that only those cities that are capturing foreign investments are actually engaged in competition, either geographically or by economic specialisation. Namely, those cities located in the centre region, Jalisco and the US-bordering. Nonetheless, as said along this work, investors may concede higher weight to other regional features and the availability of labour force, rather than the differences in local expenditures compared to other possible places to invest.

The competition at state level could be more important. Yet it is more difficult to measure given all the assumptions that should be made to construct a similar variable at states level, thus it has not been considered as part of this research.

In the third chapter it was found that local governments in big cities have very little influence on firms productivity, while in the national average, municipalities are capable to foster productivity by means of infrastructure construction. Some researchers highlight that governments can influence in firms decisions, but they generally would foster inefficiencies, thus their effect on productivity could be negative (Thomas, 2011), and other empirical works had similar findings (Bernini and Pellegrini, 2011, Criscuolo et al., 2012). In the Mexican case, this happened for big cities, that is, in average their expenditures in economic policies are positively related to investment growth –results in chapter 2-, while they have a null or even negative relationship with productivity. The effects are particularly negative for foreign firms, which could be related to competition with domestic firms, as well as inefficiencies.

It is of special interest the fact that PII showed negative or null correlation with domestic firms, while it was positive regarding to foreign ones. This is indeed worrisome, since public infrastructure projects might be aimed to needs of foreign firms, such that domestic ones are negatively affected.

A central contribution of these models is the competitive relationship identified between national and foreign firms, always with less effect for the manufacturing sector. More importantly, the presence of domestic firms with higher productivity is more harmful for foreign firms. It can be also interpreted as competition for economic resources. They might

not compete in the same final market, but they compete for skilled labour force, political support, and other local endowments. Moreover, given that spillovers occur from foreign to domestic firms, many of the later can be benefited from higher productive foreign firms, but not the other way round.

At state level, government expenditures in both EF&S and PII have positive effects in productivity. Likewise, the federal physical investment is clearly influential in productivity increases. It is of essential interest the impact of corruption in the productivity of firms. The model showed that government corruption has a negative sign and its effects can be even similar to EF&S expenditures from the base model. In this way, the reduction of corruption becomes a highly significant issue to tackle when formulating economic policies plans. The simplification of procedures to open a new firm might help to this aim, to some extent, since the index attempts to measure the corruption level in public offices which in order to make use of a public service it is necessary to offer a bribe, for people and firms. Nevertheless, according to the World Bank surveys (Bank, 2007), bribes is part of the operating system when opening new businesses in Mexico, which might impact more significantly to SME's firms.

In the fourth chapter, it was confirmed that cities are places of flows and networking within the space, and the local organisation can play a determinant role in the economic performance. It was found that different models can serve to foster economic growth at the local level. Yet, federal and state support is critical for success. When there is not enough support, politically and financially from upper level institutions, the local policies cannot transcend or their results will be limited.

In the case of Mexicali, they have achieved significantly large growth ratios, but from 2003-2010. Hermosillo has accomplished higher rates, and above the national average, it is a result of a top-down policy, accompanied of larger amount of funds to the automotive. Still, there are some good practices in both cases, perhaps the most important could be the long-term visioning in Mexicali, and the support for domestic firms, especially SME's, in Hermosillo. Some policies could be identified with the LED strategies, particularly in case of Mexicali, given that the process belong to the people rather to the authorities, and the planning do not depend on the political cycle alike most of Mexican municipalities including Hermosillo. Still, in Mexicali the policies aim to increase labour force skills and foreign investment, while domestic firms have received less attention. Meanwhile

Hermosillo focuses to develop two industries, these are, the automotive and aerospace, which is a very traditional development approach, yet more attention to local enterprises is given from the state and municipal governments.

In sum, this thesis work provides information about local and state economic policies and the resources spent with those aims. It showed the importance of some regional features for investment and productivity such as domestic market potential, US market potential, economic specialisation/diversity, health, public infrastructure stock, and share of manufacturing employment. It has been of particular interest the fieldwork undertaken to understand the daily life in the local administrations and their relationship between local stakeholders, the behaviour of local and foreign firms, as well as the rationale behind the economic performance of places and the kinds of policies followed.

### 3. Limitations of this work

There is a rich database in Mexico at the firm level, unfortunately given confidentiality problems it is not possible to work at this analysis level. In this research it has been chosen to work at city and state levels, but it could be also possible to build analysis for economic activities. Cities are not the common subject of study in Mexico, even when federal government and other institutions have started to monitor their role as planner of the economic life in the country. In consequence, although it could be too broad to use cities and state levels to measure productivity and investment growth, given that the information of expenditures cannot be disaggregated, I considered more important to find the average influence in the local and regional economies.

As regards with the statistical model chosen, as explained before, given the availability of the data and the city-region approach, it was considered that using a model with FE and Driscoll-Kraay standard errors to account for spatial dependence, was the most appropriate. For instance a different study can be undertaken if using multilevel modelling employing the economic activities as nested entities within the cities and the cities within the regions or states. Further work with this methodology would be interesting, since it allows counting effects at different levels at the same time. That is valid, but it was shown that the results of this research are consistent.

There could be others claiming that spatial econometrics could be more adequate for cities and regions. Nonetheless, the cities in the sample are not neighbours, especially in the

north region where cities are spread. Spatial models could be used when analysing the centre and south region of Mexico, where closeness of cities may influence to a larger extent the economic performance of the neighbours. Also, there is more information for regional entities smaller than municipalities that in populated areas makes sense, but not in spread populations.

Another important limitation would be the number of years available in the data. With the number of municipalities in the sample data for 10 continuous years would have been much better, but this is simply a data limitation. Still, the models showed consistency in different methods used, FE, FE with Driscoll and Kraay Standard errors, and Difference-GMM. There were also excluded potential outliers, to increase efficiency.

#### 4. Policies implications

This work has been undertaken with the sponsorship of the Mexican government through the Federal Department for Science and Technology, CONACYT. Thus I feel committed to mention some policy implications in Mexico given the results obtained.

Undoubtedly, fiscal and political decentralisation has been beneficial to local and regional administrations. It has increased the capabilities at local and regional levels to pursue economic success. This is not an adventurous conclusion even if I do not compare two periods and I will explain why. Before the period of study the local finances were simply very limited, as shown on Figure 3.1 this work do not compare the expenditure capabilities before and after the major reforms were done simply because the budgets were much smaller and most programs were in charge of the federal government as mentioned through the chapters. Additionally, it was the time when the top-down approach was prevailing in policymaking, thus local and municipal authorities had little participation. Their participation has been increasing through the time, but without the resources, actions were not fully in charge of locals, even now there is partnership which does not allow local/state governments to act on their own in most aspects.

However, as the expenditures chapters revised here have increased given the growth of federal transfers, which is a result of decentralisation in Mexico, it can be said that decentralisation has endowed municipal and state governments to pursue economic growth and undertake investment projects of diverse nature as described along this thesis. Yet, it

should not be neglected that federal investment is still a significant driver for productivity increases, thus no conclusion can be made about compared efficiency.

According to the results, some municipal expenditure could negatively impact productivity, while it was always positive for federal and state investments. This could cast doubts about municipal efficiency in expenditures, but as mentioned in the corresponding chapter, this is not a justification to stop but to increase efficiency in some areas. Moreover, this was true for larger cities but not for the total municipalities. In consequence, even if the results of the models vary depending on the group analysed, the averages showed that spending chapters might have positive influence over investment and productivity. More importantly, from the fieldwork, it was confirmed that decentralisation is not only about the resources but the opportunities that this represent for local grounded policies which could boost economic development and this is very different all along the country.

In addition, the changes in the distribution formula of federal transfers have reduced the difference in funds per capita received by wealthier municipalities. That is, at the beginning of the period, the wealthier municipalities received larger resources than poorer, but this difference has diminished over the time. However, there are still lots of limitations to undertake projects at local levels. This opens the channel for Pork-Barrel politics and favouritism; since the support from federal and state governments are essential for success, as shown with the case studies. I do not suggest to increase deliberately the resources to local levels, but to support and encourage them to compile their own planning built upon consented plans with clear aims.

In this context, emerge the recent problems in local and state administrations in Mexico that have recurred to significant loans from the banking sector. On the one hand, it could be related to corruption and mismanagement, that is, they borrow money because they waste a significant proportion of the funds available. As mentioned in the third chapter, about 50% of local outflows are exerted on current expenditures, which some might consider mismanagement. On the other, most times these resources are borrowed to build public infrastructure, given the lag at this regard in lot of Mexican cities and states. Clearly, infrastructure works are tasks in which corruption could be more easily undertaken (Straub, 2008), yet it was found that their expenditures have been beneficial for investment and productivity growth, especially at the state level. It is also true that physical

investments are among those actions that can be easily judged and linked with one party or politician, so they might seek for investing in such tasks (Mädig, 2006), but Mexico is not yet in the point of decreasing returns to infrastructure (Fuentes, 2003).

Consequently, increasing the public infrastructure stock is certainly related to increments in quality of life and productivity, but since municipalities and states it is certain received more liberties to take loans, many of them have used that right and it does not need the approval of the national parliament, but the state. Indeed, this can foster corruption, because less accountability is possible when this is the case. Hence, seeking for funds outside of the fiscal systems opened a channel for corruption, which was not frequently used before. Therefore, it is clear that the provision of larger resources to municipalities and states could improve their position to pursue economic development, and would allow for evaluation of policies, that is not possible when the loans come through the financial system.

Finally, corruption showed to be a significant obstacle for productivity, which although it has been only assessed at the state level, it is present in all government levels. The results of this research validate once more time, the need of greater efforts to reduce corruption which might benefit firms and citizens to a very great extent.

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## Annexes

### A.1 Estimation method for infrastructure variable

In Mexico, it is common to find researchers that only use the number of landlines per 100 inhabitants as an infrastructure indicator. The indicator constructed here is more comprehensive. It includes indicators for communications and transports, and energy supply. The variables are the following:

- Communications and transports:

- Number of flight passengers over total of population in the Municipality. This is an indicator for air traffic and the airport capacity. Of course this also indicates the demand level of the city and the touristic places have larger amount of people coming, still some places could be small or there could be so few number of flights, so people travel by bus from near cities better connected. Therefore this is taken as an indicator for installed capacity for transports.
- Kilometres of main roads over the total Municipality area (Km<sup>2</sup>).

- Energy supply:

- Total of water feeds over total inhabitants in the Municipality.
- Number of power points over total inhabitants in the Municipality.

- Basic infrastructure.

- Number of drainage feeds per inhabitant.

It is worth noting that the information on endowments encompasses the whole municipality, therefore as a weighting indicator it have been taken the total inhabitants in the Municipality and the total area (Km<sup>2</sup>) rather than only the city. The information was obtained from the statistics annual books published by INEGI

The values of these four variables were normalised, taking the maximum value equal to 100. The variables within the same category are averaged. And the total index is estimated

using the geometric mean of all categories. For more information about this method see Delgado and Alvarez (2001).

## A.2 Tables

A. Table 1 Metropolitan Areas and cities included in the sample.

Code MA/city	Name	Population in 2010	Code MA/city	Name	Population in 2010
21	MA de Guadalajara	4,434,878.00	46	MA de Tlaxcala-Apizaco	499,567.00
31	MA de Monterrey	4,089,962.00	1110	Celaya	468,469.00
34	MA de Puebla-Tlaxcala	2,759,383.00	201	Ensenada	466,814.00
24	MA de Toluca	1,846,116.00	2518	Mazatlan	438,434.00
2	MA de Tijuana	1,751,430.00	29	MA de Cuautla	436,318.00
14	MA de León	1,609,504.00	2516	Ahome	416,299.00
11	MA de Juárez	1,332,131.00	50	MA de Orizaba	410,508.00
4	MA de La Laguna	1,215,817.00	2619	Cajeme	409,310.00
36	MA de Querétaro	1,097,025.00	45	MA de Nuevo Laredo	384,033.00
38	MA de San Luis Potosí-Soledad de G. S.	1,040,443.00	22	MA de Puerto Vallarta	379,886.00
55	MA de Mérida	973,046.00	51	MA de Minatitlán	364,311.00
3	MA de Mexicali	936,826.00	52	MA de Coatzacoalcos	347,257.00
1	MA de Aguascalientes	932,369.00	2823	Ciudad Victoria	341,773.00
28	MA de Cuernavaca	876,083.00	8	MA de Colima-Villa de Álvarez	334,240.00
17	MA de Acapulco	863,431.00	708	Tapachula	320,451.00
42	MA de Tampico	859,419.00	6	MA de Monclova-Frontera	317,313.00
2517	Culiacan	858,638.00	53	MA de Córdoba	316,032.00
12	MA de Chihuahua	852,533.00	1614	Uruapan	315,350.00
5	MA de Saltillo	844,918.00	56	MA de Zacatecas- Guadalupe	298,167.00
25	MA de Morelia	807,902.00	35	MA de Tehuacán	296,899.00
47	MA de Veracruz	801,295.00	1112	Salamanca	260,732.00
2620	Hermosillo	784,342.00	302	La Paz	251,871.00
43	MA de Reynosa-Río Bravo	727,150.00	26	MA de Zamora-Jacona	250,113.00
37	MA de Cancún	677,379.00	2315	Othon Blanco	244,553.00
48	MA de Xalapa	666,535.00	1213	Chilpancingo de los Bravo	241,717.00
10	MA de Tuxtla Gutiérrez	640,977.00	303	Los Cabos	238,487.00
44	MA de Matamoros	600,852.00	2621	Nogales	220,292.00
32	MA de Oaxaca	593,658.00	706	Ocosingo	198,877.00
1009	Durango	582,267.00	707	San Cristóbal de las Casas	185,917.00
1111	Irapuato	529,440.00	2622	SLRC	178,380.00
49	MA de Poza Rica	513,518.00	30	MA de Tepic	98,204.00
18	MA de Pachuca	512,196.00	30	MA de Tepic	98,204.00
			30	MA de Tepic	98,204.00

Source: Metropolitan Areas defined by CONAPO in 2005.

**A. Table 2 Economic activities included in the data base.**

Code	Activity	Number of cities specialised on each economic activity			
		1993	1998	2003	2008
31	Food, beverages and tobacco	30	24	25	7
32	Textiles, clothing and leather industries	1	0	0	0
33	Industries of wood and wood products. Includes furniture	1	2	0	0
34	Paper and paper products, printing and publishing	0	0	1	0
35	Chemical substances, products derived from the oil and from the coal, from rubber and plastic	7	7	8	1
36	Non-metallic mineral products, excluding petroleum and coal products	0	0	0	0
37	Metallic basic industries	2	2	2	2
38	Metal products, machinery, and equipment. Includes surgical-and precision instruments, and the automotive.	19	24	22	12
39	Other manufacturing industries	0			0
61	Wholesale Trade	0*	0*	0*	0*
62	Retail Trade	0*	0*	0*	0*
82	Services of rent and administration of real estate and Services of rent of personal property	0	0	0	36
92	Educational, research, medical, social assistance and partnership services	1	0	0	0
93	Restaurants and hotels	5	7	9	7
94	Recreational, cultural, recreational and sports services	0		0	0
95	Professional, technical, specialised, and personal services. includes loans to enterprises	1	0	0	2
96-97	Other services except Government activities	0	1	0	0

Note: Some activities such as transports, communications, and financing services were excluded because there was no information for all years. The activities are classified according to the Mexican Catalogue for Productive Activities (CMAP).  
\* Since cities are important distribution centres, it was considered specialisations other than trade, that is, products in which cities could be competing with any other.

**A. Table 3 Metropolitan Areas and Cities by region. Functional classification by SEDESOL (2001).**

Region	Cities/MA
<b>Northwest</b>	Metropolitan Area/City, MA de Tijuana, MA de Mexicali, Ensenada, La Paz, Los Cabos, Ahome, Culiacan, Mazatlan, Cajeme, Hermosillo, Nogales, SLRC.
<b>North-Centre</b>	MA de Juárez, MA de Chihuahua, Durango.
<b>Northeast</b>	MA de Saltillo, MA de Monclova-Frontera, MA de Monterrey, MA de San Luis Potosí-Soledad de G. S., MA de Tampico, MA de Reynosa-Río Bravo, MA de Matamoros, MA de Nuevo Laredo, Ciudad Victoria.
<b>Centre-west</b>	MA de Aguascalientes, MA de Colima-Villa de Álvarez, MA de León, MA de Guadalajara, MA de Puerto Vallarta, MA de Morelia, MA de Zamora-Jacona, MA de Tepic, MA de Zacatecas-Guadalupe, Celaya, Irapuato, Salamanca, Uruapan, MA del Valle de México.
<b>Centre</b>	MA de Acapulco, MA de Pachuca, MA de Toluca, MA de Cuernavaca, MA de Cuautla, MA de Puebla-Tlaxcala, MA de Tehuacán, MA de Querétaro, MA de Tlaxcala-Apizaco, MA de Veracruz, MA de Xalapa, MA de Poza Rica, MA de Orizaba, MA de Minatitlán, MA de Coatzacoalcos, MA de Córdoba, Chilpancingo de los Bravo.
<b>South</b>	MA de Tuxtla Gutiérrez, MA de Oaxaca, Ocosingo, San Cristóbal de las Casas, Tapachula.
<b>Southeast</b>	MA de Cancún, MA de Villahermosa, MA de Mérida, Campeche, Carmen, Othon Blanco.

A. Table 4 List of interviews undertaken by person, charge and organisation in Hermosillo

City	Name	Organisation	Charge	Organisation functions/role
<b>Hermosillo</b>	Verónica Yanez Córdova	Municipal Bureau for Economic Development of Hermosillo	Director of regulation improvement	<p>It was created in 2007 in order to contribute and foster the economic development of Hermosillo. The services offered are directed to three kinds of costumers:</p> <ul style="list-style-type: none"> <li>- Entrepreneurs. Those who want to open an enterprise.</li> <li>- Employers. Those who already have a business running but they want to expand it.</li> <li>- Investors. Those who want to invest in the city.</li> </ul> <p>The centre offers business advisory and training. It offers guidance with Federal, State, and Municipal paperwork. In addition, it offers financing, provides some socioeconomic information that helps on the decision making for entrepreneurs, and grant local tax exemptions to those ones eligible.</p>
<b>Hermosillo</b>	Jesus Gámez	AMS (Maquiladoras Association of Sonora) chapter Hermosillo	Ex-director	<p>Provide an environment of mutual support among the Associates that ensures good relations among the different companies operating in the region with the goal of unity and well-being.</p> <p>Facilitate representation of the interest of the Maquiladora Industry before diverse forums, principally the three levels of government.</p> <p>Heed, analyse and seek solutions to the problems that affect the Maquiladora Industry, promoting measures that favour the membership. The Hermosillo section is only 6 years old.</p>
<b>Hermosillo</b>	Octavio Sánchez	CANACINTRA (National Chamber of the Transformation Industry) Chapter Hermosillo	Treasurer	<p>Its essential function is to represent the interests of their members, promote governmental actions and other business organisations to foster industrial activity and defend the members from government policies and measures at the Federal, State and Municipal that affects industrial activity in the country. The chamber has delegations all around the country to organise and represent the industrial activity.</p>
<b>Hermosillo</b>	Lorenzo Galván García	Secretariat of Economy (state level)	Sub-secretary of merchandising	<p>This is the bureau for economic development and growth at the State level. It has the aim to implement policies to foster employment, investment, and production increment.</p>
<b>Hermosillo</b>	Enrique Ruiz	COPRESON (Council for Economic Promotion of Sonora)	General director	<p>The Economic Development Council for Sonora has its origin in the State government period 1997-2003; it was created by Executive Decree. This organism emerged as a response of the State Public Administration to formalize a firm and lasting alliance with the various economic sectors of the entity, with the fundamental and special vision of proposing joint strategies to respond efficiently and effectively to the challenges, threats, weaknesses and opportunities presented to Sonora nationally and internationally.</p> <p>It offers business advisory in aspects such as labour force availability, supplier chains, cost of living, instalment cost, law and incentives, as well as international regulations and requirement for those willing to export. They also have offices around the State in order to give some personalised support in different cities.</p>
<b>Hermosillo</b>	Marco Antonio González Cubillas	CANACOPE (National Chamber for Small Firms on Retail Trade, Services and Tourism) Sonora chapter	President and coordinator of the entrepreneurial organisations in Hermosillo	<p>CANACOPE is the National Chamber of small firms in trade, services and tourism. This is the branch in Hermosillo, that also includes the south region in the state. It helps the small firms to get some financing from the programs running by the Economic Development departments at the Municipal or State levels. They also provide some administration assistance and information with some paperwork.</p> <p>The interview was aimed to hear about his role as coordinator from the other entrepreneurial organisations.</p>
<b>Hermosillo</b>	Rigoberto Yáñez Germán	ProMexico	Director of Sonora chapter	<p>Is the Federal bureau to promote the attraction of direct foreign investment and the export of goods and services, as well as the internationalization of Mexican companies in order to contribute to Mexico's economic and social development and strengthen the country's image as a strategic business partner.</p>
<b>Hermosillo</b>	Dr. Pablo Wong Gozález	CIAD (Research Centre for Food and Development)	Director	<p>It is a research centre and offers postgraduate programs in food technology as well as in regional and development studies. Dr. Wong is part of the National Researchers System from CONACYT, and has worked with development and regional economics for more than 15 years.</p>

<b>Hermosillo</b>	Lic. Mario Cuén Aranda	Treasury. State level	Secretary	It is the treasury department at the State level. He has been public officer for long time, even a Municipal president in a small city. Therefore it was also interesting to hear its point of view
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**A. Table 5 List of interviews undertaken by person, charge and organisation in Mexicali**

City	Name	Organisation	Charge	Organisation functions/role
<b>Mexicali</b>	BA Mario Iván Martija	CANACINTRA (National chamber of transformation industry) chapter Mexicali	Director	Its essential function is to represent the interests of their members, promote governmental actions and other business organisations to foster industrial activity and defend the members from government policies and measures at the Federal, State and Municipal that affects industrial activity in the country. The chamber has delegations all around the country to organise and represent the industrial activity.
<b>Mexicali</b>	BA Francisco Rodriguez	CCE (Business coordinating committee)	Manager	It represents and groups the Mexican private sector. Its main goal is to coordinate policies and actions of business organisations, and identify strategic positions with specific solutions that help to design policies to boost economic growth and the competitiveness of both companies and the country.  As a representative and interlocutor of Mexican entrepreneurs, the CCE works to promote the free market, full democracy, social responsibility and equality of opportunity for people
<b>Mexicali</b>	BA René Xavier Acuña	CDEM (Council for the Economic Development of Mexicali)	Executive director	The Council for the Economic Development (CDEM) in Mexicali is a citizen organism created in 1993. Among its main tasks are the following: - Create and track economic development strategies for Mexicali.  - Make economic, financial, social and cultural studies.  - Encourage educational programs to prepare and develop knowledge and skills employers and employees, educators and students.  - Promote, manage and obtain public and private resources, to make and maintain these programs.
<b>Mexicali</b>	René Mauricio Marín Rivas	AMMAC (Maquiladoras Association of Mexicali)	Director	It is an enterprise department founded by the export maquiladora industries in Mexicali in 1978, which membership is volunteer. They offer consultancy in Custom, migration, social security, housing, environment issues, maquiladora programs and permissions, labour issues, fiscal issues, Transport.
<b>Mexicali</b>	BA Guillermo Chacón Stratta	Municipal government	Particular secretary of the Municipal President	
<b>Mexicali</b>	BA Carlos Córdova	CDI (Industrial Development Commission of Mexicali)	Executive Director	Is a business organisation founded in 1977 as a result from business community and government efforts, with the purpose to attract, grow, and retain business for Mexicali on the industrial and manufacturing activities.
<b>Mexicali</b>	Dr. Noé Aarón Fuentes	COLEF (College of the Northern Border) chapter Tijuana	Full time researcher and lecturer	The COLEF is an institution of scientific research and high-level teaching, specialised in the study of the problems of the Mexican region bordering the United States, which seeks to transform the knowledge generated inputs for planning and decisions that contribute to the improvement and development of the region. Dr. Fuentes have actively participated in regional planning in the state. His team has helped with firms consulting as well as government advisory.

## A.3 Boxes

### Box 1 Major actions identified in each city

City	Mexicali	
Problem	Solution	Results/ Improvement
<b>Planning practices</b>		
<b>Uncertainty in local planning. Lack of continuity with the plans. Every three years, new public servants come to the municipal administration and make a new plan.</b>	Creation of a council for economic development that is public-private, and has a defined plan to follow until 2020.	Instead of a new plan every three years, in 2001 it was formulated a plan for 20 years, which was ordered law, thus local authorities have to comply to it.
	The same director remains in charge regardless the political term.	The effects of political cycle are much smaller, since public officers and Stakeholders do not have to learn about the new policies every term.
	Previous directors are among the presidency board.	Also the public officers remain for longer in planning areas, which diminish the training costs.
	The Presidency board also have public officers from other levels of government as well as representatives from the private sectors.	
<b>The plans usually do not correspond with the municipality needs</b>	In 2001 there were created different committees to assess the city in every matter and propose a number of actions to be completed by 2020.	The plan is purely based on what has been identified as a problem, not only by public servants, but also by entrepreneurs representatives and other local entrepreneurs.
<b>Labour force</b>		
<b>High rotation of labour force and high emigration rates.</b>	CDEM created a program to run TV adverts and foster values in working people	These actions, together with the better living conditions and low insecurity levels, have helped to diminish the emigration levels.
	CDEM promotes achievements by the city to foster pride and attachment. They also run different adverts to emphasize the good living conditions and low insecurity levels.	
	The programs have been running for 10 years now.	
		Also, there has been an increment in immigrants with higher qualification level. In 1990 only 10% of immigrants had a professional degree, while by 2010, the share was 20%.
<b>Low labour force qualifications.</b>	CDEM has worked their program "Linking firms and schools" in order to foster employees to continue higher education levels. The firms have also showed their support to employees and in many cases they might have better wages.	All interviewees asserted that entrepreneurs qualify local labour as highly competitive. Especially foreign firms are happy with the commitment of workers. This cannot be found in books, but they stated that Honeywell director appointed the labour force as the most competitive among its branches around the world
<b>Low ratios of matriculate in engineer and technological careers.</b>	CDEM has promoted such careers among young people.	By 2001, when the evaluation was made about 15-18% of the matriculate in superior studies was in engineering and technological careers, while it increased to 31% by 2009.
		There have been created new careers on aerospace and bioengineering themes.
<b>Investment</b>		
<b>Lack of investment promotion</b>	There was created an institute CDI at the local level to increase promotion. In this institute there is participation from businessmen who provide funding.	Given the presence of entrepreneurs, the efficiency in promotion is high, according to the interviewees. And as seen in the respective section, Mexicali has significant manufacturing production by foreign firms and joint-ventures
	Targeted promotion by CDI working in coordination with CDEM	Consolidation of Aerospace industry, completing its supply chain by attracting specific firms
<b>Infrastructure</b>		
<b>Need of better equipped industrial parks</b>	The industrial parks are built in co-participation of private-public actor who actively promote the city	The foreign investors assert that Mexicali industrial parks are well equipped for high technology.
		Also its infrastructure index is considerably high and well ranked by the IMCO

		The aerospace cluster is high technology, and the most consolidated around the country.
<b>City</b>	<b>Hermosillo</b>	
<b>Problem</b>	<b>Solution</b>	<b>Results/ Improvement</b>
<b>Planning</b>		
<b>Municipalities plan for shorter periods and they have few monetary resources available</b>	COPRESON is aimed to do planning for longer periods and attend firm's needs, while lobbying for federal incentives.	There have been identified firms to complete clusters and increase competitiveness of foreign firms
<b>Business environment</b>		
<b>Difficult paperwork. Which is a general problem in Mexico</b>	The Municipal Bureau for Economic Promotion is intended to ease paperwork for all firms, especially for domestic ones.	They received an award in 2009 from the Doing Business project; section Mexico, for being the fastest to concede a construction permit.
		The Bureau helps firms to access loans from municipal, state or federal funds.
	The municipal Bureau also retains some employees to ensure continuity in the whole project, which is aimed to develop the "one stop shop" to every service required to open a new firm	There is less cost of training. Although the president of the Bureau is changed every 3 years
	The Secretariat of Economy helps firms to develop their trade mark and to certify processes. Especially in the agro alimentary industry	They have helped some firms to extend their markets, as well as to contact with universities to get some help on sanitary restrictions and improvements in shelf life
<b>Need of resources to comply with certifications</b>	COPRESON provides funds to firms that need to pay certifications to supply the automotive industry.	
<b>Infrastructure</b>		
<b>Lack of infrastructure</b>	There is also a commission to develop industrial parks, who also undertake promotion of the city.	
<b>Accessibility difficulties</b>	COPRESON provides consultancy on logistics to foreign investors in order to increase the number of firms landed.	
<b>Investment</b>		
<b>Less investment from foreign firms. Ford plant willing to close and move to another state in the centre-region</b>	COPRESON identified that Ford plant was moving. Since it is the main support of the economy, they offered a series of incentives and infrastructure to help it to stay	The firm stayed and invested to renew the whole plant, such that it is now among the most competitive within Ford Motor Company
	ProMexico and COPRESON have worked hard to increase incentives to firms within the automotive, but especially the aerospace	The cluster is developing in Guaymas, but some investment is expected to land also in Hermosillo
<b>Need of continuity when bargaining for firms landing.</b>	The work of COPRESON is fully oriented to firm's needs. Each advisor is designated with some firms and they must strive to provide what they need to be landed.	Less training costs.
<b>Waite of resources when the promotion is not specialised.</b>	COPRESON works only with targeted investments and firms	
<b>Labour force</b>		
<b>Gap between technical training in universities and the skills required by private firms</b>	There are training courses with the support of CANACINTRA. The costs are covered by COPRESON	They have helped firms in different times to increase labour force skills.
	Among the incentives offered to foreign firms are the training costs when opening a new plant, up to a month of wages.	

**Box 2 Questionnaire applied to the interviewees\*.**

The questions are listed according to the type of organism interviewed. This is, municipal or state economic development and promotion; Business Coordinating Committee (CCE); Maquiladoras association; National industry associations, (CANACINTRA); State level departments for economic development and investment promotion; and academic researchers.

<b><i>Municipal bureau for economic development</i></b>	
<i>Questions</i>	
1.	How would you describe the role that this centre has played in promoting the economic development of Mexicali/Hermosillo since it was created?
2.	Which have been the most important challenges to face?
3.	How do you coordinate with other economics department at the national and state levels? In institutional terms, but also about lobbying for grants and incentives to the firms.
4.	Have you been participating in the international cooperation with US for the Economic Zone? How?
5.	Are there some actions to coordinate investment attraction with Tijuana and other cities in the state?
6.	Is there any kind of cooperation/coordination with other cities in the region to promote joint economic development?
7.	Which are the main competitors for Mexicali/Hermosillo in the regional, national and international scale?
8.	Do you have any strategic economic activity to foster?
9.	Do you participate in marketing fairs? National or international? Which ones?
10.	Which kind of support do you offer?
11.	Do you offer any kind of cash grants? or just tax exemptions and reductions?
12.	Which are the most common support/services requested by the entrepreneurs to the centre? Financing, paperwork?
13.	Do you offer support for innovative enterprises?
14.	Are national/foreign originally those firms with innovative departments?
15.	Have the universities played an active participation to foster economic growth or innovation processes?
16.	Which enterprises are more likely to require the support from the Centre? SME's or big ones; national or foreign.
17.	In which economic activities?
18.	Which are the strategic sectors and activities that the city would like to develop? And therefore you may focus your support
19.	Do you participate in marketing fairs? National or international? Which ones?
20.	How is undertaken the institutional support you offer?
21.	The financing you offer is a credit or a grant? Where does it come from? How much have you spent every year in this kind of support?
22.	Do you offer any kind of cash stimulus? or just tax exemptions and reductions?
23.	How is your relationship/coordination with the entrepreneurs organisations such as CANACINTRA, COPARMEX or CCE? Do you have regular meetings?
24.	Do you offer support for innovative enterprises?
25.	Are national/foreign originally those firms with innovative departments?
26.	How does the centre promote interaction between universities and knowledge centres with the firms?
27.	Do you undertake any kind of after care for those enterprises you have been supporting?
28.	Which are the most common support/services requested by the entrepreneurs to the centre? Financing, paperwork?
Note: This includes CDEM and CDI in Mexicali, as well as the Municipal bureau for economic development in Hermosillo.	
<b><i>Business coordinating committee (CCE)</i></b>	
<i>Questions</i>	
1.	Which kind of support do the firms receive from CCE?

2. Is there any active participation from the members?
3. How big are the members firms in average (number of employees)? Could they be foreigners?
4. How is the relationship (coordination/cooperation) from CCE Mexicali with the CEDEM?
5. Do you consider the role of local and state institutions for economic development have been significant in terms of investment attraction?
6. How do you evaluate the support and services given?
7. Do you think these are dealing with the main needs from firms?
8. Which are the most important demands from the members to deal with and take it to the government table?
9. Do you consider that the monetary incentives given (tax reductions and exemptions) influence on the investment decisions? yes
10. Do you think the coordination government/enterprises have changed in the last 10 years?
11. From your point of view, which are the best places to invest in Mexico, and hence, Mexicali would be competing with?
12. Economic activities in Mexicali are competing with national or international firms?
13. Which are the main strengths from Mexicali as a place to invest?
<b><i>Maquiladoras association</i></b>
Questions
1. Which kind of support do the firms actually receive from AMMAC? Do you have personalised assistance, courses, conferences?
2. Is there any active participation from the members?
3. How big are the firms members in average in terms of employees number? Could they be foreigners?
4. Does the AMMAC undertake some lobbying to get financing?
5. How is the relationship from AMMAC with the CEDEM?
6. Which kind of support/benefits your members have received from local and state government? Under what conditions?
7. How do you evaluate the support and services given?
8. Do you think those cover the main demands from entrepreneurs?
9. Which are the most important demands from the members to deal with and take it to the government table?
10. What are the main challenges for maquiladoras? Final markets, financing, labour force, supply chain?
11. Do you consider that the monetary incentives given by government (tax reductions and exemptions) influence on the investment decisions?
12. Do you think the coordination government/maquiladoras have changed in the last 10 years?
13. On your perspective, which are the best places to invest in Mexico, and hence, Mexicali would be competing with? Is your economic activity competing with other cities in Mexico or with others countries?
14. Which do you think are the main strengths from Mexicali as a place to invest?
Note: This includes both representatives; from Mexicali and Hermosillo
<b><i>National chamber of the transformation industry. In Hermosillo (CANACINTRA)</i></b>
Questions
1. Which kind of support do the firms receive from CANACINTRA?
2. Is there any active participation from the members?
3. How big are the members firms in average (number of employees)? Could they be foreigners?
4. How is the relationship (coordination/cooperation) from CANACINTRA Hermosillo/Mexicali with the Business Developing Centre and COPRESON?
5. Do you consider the role of local and state institutions for economic development has been significant in terms of investment attraction?
6. How do you evaluate the support and services given?
7. Do you think these are dealing with the main needs from firms?
8. Which are the most important demands from the members to deal with and take it to the government table?
9. Do you consider that the monetary incentives given (tax reductions and exemptions) influence on the investment decisions?
10. Do you think the coordination government/enterprises have changed in the last 10 years?
11. From your point of view, which are the best places to invest in Mexico, and hence, Hermosillo/Mexicali would be competing with?
12. Industrial activities in Hermosillo/Mexicali are competing with national or international firms?

13. Which are the main strengths from Hermosillo/Mexicali as a place to invest? Note: This includes both representatives; from Mexicali and Hermosillo. As well as CANACOPE for being similar organisms to support its members.
<b>State level departments for economic development and investment promotion</b>
<i>Questions</i>
1. How would you describe the role that COPRESON have plaid in the economic development of Sonora since it was created?
2. Which have been the most important challenges to face?
3. How do you coordinate with other economics department at the national and municipal levels? In institutional terms, but also about lobbying for grants and incentives to the firms.
4. Have you been participating in the international cooperation with US? How?
5. Which are the main competitors for Sonora in the national and international scale?
6. Which kind of enterprises is more common require the support from COPRESON? SME's or big ones; national or foreign.
7. In which economic activities?
8. Do you have regional marketing planning in order to promote some cities or areas more than others? Or some economic activities more than others?
9. Do you participate in marketing fairs? National or international? Which ones?
10. Which kind of institutional support do you offer?
11. How operates the "softlanding" program?
12. Do you offer any kind of cash grants? or just tax exemptions and reductions?
13. Which are the most common support/services requested by the entrepreneurs to the centre? Financing, paperwork?
14. How is your relationship with the entrepreneurs organisations such as CANACINTRA or CCE?
15. Do you offer support for innovative enterprises?
16. Are national/foreign originally those firms with innovative departments?
17. Is there any coordination with research centres/ universities and the firms by means of COPRESON? Have they played an active participation to foster economic growth or innovation processes?
18. How do you undertake the after care to the enterprises?
Note: This includes Promexico, Secretariat of Economy and COPRESON in Hermosillo
<b>Academic researchers</b>
<b>Dr. Pablo Wong González</b>
<i>Questions</i>
1. Which had been the main economic shocks faced by Hermosillo? From 1993 to 2008.
2. Why did it showed negative gdp growth during the periods 1998-2003?
3. How do you evaluate the money spent by the local and state government in investment promotion? is it being spent on bureaucracy, or in actual incentives?
4. Are the national firms benefiting from them?
5. How do you evaluate the role from local governments in the period 1993-2008? Considering the gained spending powers, and the increment in local responsibilities.
6. Which are the main competitors for Hermosillo?
7. Do other cities, within the state, benefit from the new investment in Hermosillo?
8. Are there some complementary roles?
9. Which has been the role plaid by universities and research centres?
10. Has Hermosillo gotten any benefit from border cooperation/coordination?
<b>Dr. Noe Aarón Fuentes</b>
<i>Questions</i>
1. Which do you consider are the main drivers for economic growth in Mexicali, apart from its geographical location, if there is any?
2. Which had been the main economic shocks faced by Mexicali? From 1993 to 2008.
3. Why this region have maintained economic dynamism differently to the whole country? Have the public policies driven this? Or the international economy?
4. How do you evaluate the money spent by the local and state government in investment promotion? is it being spent on bureaucracy, or in actual incentives?
5. Are the national firms benefiting from them?

6.	How do you evaluate the role from local governments in the period 1993-2008? Considering the gained spending powers, and the increment in local responsibilities.
7.	Which are the main competitors for Mexicali as a place to invest?
8.	Do other cities, within the state, benefit from the new investment towards Mexicali or Tijuana and vice versa? Would you describe it as competitive or complementary relations?
9.	Which has been the role plaid by universities and research centres?
10.	How do you find the coordination between the three government levels?
11.	How has changed the role of the municipalities in economic planning in the last 15 years?
12.	To what extent would you assert that the municipality is empowered to attract and retain investment?
<b><i>Secretary of finances in Sonora</i></b>	
1.	Could you please talk about the real capacity from local governments to foster economic growth and investment attraction?
2.	Is there any difference now from 10 or 15 year ago, that is from 2002 or 1998?
3.	How are incentives allocated to firms? National, foreign?
4.	Would you say local government is defining investment attraction strategies, or only at the state level?
5.	What could you say about the role of the state and the municipality as promoters for economic growth?
6.	Do you participate in any planning activity in the state/municipality?
7.	Where do the ideas, plans and vision come from?
Note: Similar questions were made to the municipal secretary in Mexicali.	

\*All questionnaires are just a guide, the representatives talked about specific issues, relationships, and most of times delivered more information than what was requested with the aim to provide a bigger picture of the reality in each place.