

Act 20 & 22 Economic Impact Study

December 18, 2015



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*The information provided is based on DDEC's CRM database of Act 22 Applications and Annual Reports. Data reflects all decrees approved as of 11/02/2015. It is important to note that database is self-reported and hence subject to inherent limitations in terms of potential human errors.

EXECUTIVE SUMMARY

During the past 25 years manufacturing employment in Puerto Rico has seen a consistent decline. During the same period, professional services employment increased almost continuously. This evidences Puerto Rico's transition to a service economy, even though manufacturing output, due to its high productivity gains, has remained the main contributor to Puerto Rico's GNP.

The economy's state calls for a wide ranging set of actions that will generate investment, stimulate productive activity and provide the basis for development of an advanced services sector with export potential. Both Law 20 and Law 22 address these needs by stimulating local production beyond domestic demand. In this respect, both incentive programs will contribute to a more robust service sector and thus, higher exports.

This report highlights Act 20 and Act 22 performance, particularly by providing a summary profile of current program beneficiaries along with detailed descriptions of their impact in the economy and potential impacts in a 10 year timeframe. The findings evidence the importance of maintaining both acts, since their positive effects are maximized when both laws are combined. Both pieces of legislation will continue to foster the development of Puerto Rico's service economy, increase the share of service export as a share of total exports, and ultimately run a service trade surplus of high-skill and high-paying services.

Currently Act 22 has added over \$266 million in acquired real estate, and by 2020 grantees will have demanded close to \$1,000 million in real estate investments. These investments will provide an injection of capital to the local construction industry. Moreover, the total value of individual expenditures of Act 22 grantees will reach over \$830 million by 2024. Individual expenditures will provide for a wider tax base in Puerto Rico's economy.

Similarly, Act 20 has generated new economic activity by exporting services and increasing Puerto Rico's participation in the global economy. This Law has provided the greatest opportunity for technology transfer and spillover effects in the local economy. The analysis performed for this report shows that close to 20% of Act 20 decree holders are local companies and more than 33% export to destinations beyond the U.S. market. In terms of the current economic impact a total of 7,033 direct, indirect and induced jobs are generated by the incentive program. It is estimated that by 2024 close to 50,000 direct employment opportunities will be created. The study reveals that jobs created under this program have a salary above the Island's average employee compensation. Finally by 2024 Act 20 companies would have accumulated over \$38.5 billion in gross revenue and paid over \$800 million in corporate income taxes.

INTRODUCTION



Introduction

Since the end of World War II Puerto Rico has consistently maintained an economic development strategy which retains at its core, the attraction of foreign capital or foreign direct investment (FDI), with the aim of creating new economic activity. Such a strategy has been almost exclusively focused on new productive capacity in the form of capital-intensive manufacturing facilities. However, Puerto Rico's factor endowments have migrated from a traditional *maquiladora* (low-skill, labor surplus type of economy)¹ to a high-skill post-industrial service economy. The pool of highly educated resources has allowed for the development of a domestic service provider class that has fueled the shift to a post-industrial economy². These new service based ventures have been mainly dependent on internal demand. Hence, due to the decline in manufacturing activity and the increase in local service providers, Puerto Rico's service economy has maintained a trend which could eventually catch up with the traditional manufacturing economy in terms of its impact on the aggregate economy.

At the US level most states employ local policy tools to attract external investment. Puerto Rico, benefiting from its fiscal autonomy has employed fiscal policy tools to attract foreign capital and develop new economic activity. The main actors in this new scenario are fiscal policies that promote trade in services. Both Act 20 and Act 22 support movement in this direction.

The Department of Economic Development & Commerce (DDEC, for its Spanish

acronym) is the agency responsible for Act 20 of 2012, known as the Law to Promote the Export of Services, as amended, and Act 22 of 2012, known as the Law to Encourage the Transfer of Individual Investors to Puerto Rico, as amended. Utilizing both laws, since 2013, one of the DDEC's main economic development strategies has focused on making Puerto Rico a top destination for business as well as an attractive location for establishing residence, for both high-profile individuals and companies.

Act 20-2012 seeks to provide the appropriate environment and opportunities to make Puerto Rico a center of international services, by encouraging local service providers to expand their business and services to clients located outside the Island, and persuading foreign service providers to relocate their operations to Puerto Rico. Act 22-2012 focuses on drawing new residents to Puerto Rico by providing a 100% exemption from Puerto Rico income taxes on all passive income realized or accrued after such individuals become bona fide residents of Puerto Rico.

Currently few policy tools have the advantages to combine a scheme similar to the previous FDI era, particularly with our current economic profile. That is, the ability to create a series of incentives that- when combined- allows creating new economic activity by moving beyond domestic demand and satisfying increasing international demand for Puerto Rican products and services. At the same time that it attracts new productive capacity into the

¹ For an original description of the concept of *labour surplus* see Lewis, W. A. *Economic Development with Unlimited Supplies of Labour*. Manchester School, 22, May: 139-191, (1954)

² For a recent definition of the term *post-industrialization* see D. Rodrik. *Premature Deindustrialization*, JFK School of Government, Harvard University (2015)

local economy, it strengthens local economic activity in Puerto Rico. The Island's challenge is to maximize the spillover effects from both, the export of services and the law 22 decree holders (grantees).



Act 20-2012 seeks to provide the appropriate environment and opportunities to make Puerto Rico a center of international services

Such policies have the effect to boost the competitiveness of firms established in Puerto Rico, vis-à-vis other U.S and international jurisdictions. These policies alone are not sufficient to pull Puerto Rico out of its recent economic malaise, yet, these measures, combined with adequate policy interventions that guarantee higher spillover effects (internal linkages) have a great potential to bootstrap economic development within a small, open and export oriented economy. Both pieces of legislation will continue to foster the development of Puerto Rico's service economy, increase the share of service export as a share of total exports, and ultimately run a service trade surplus of high-skill and high-paying services.

The effects of these policy tools cannot be observed individually. To maximize the potential of both laws, they must operate together. That is, the best scenario for these laws to operate is to use Act 22 as an incentive to import new capital and knowhow into the economy, and Act 20 as

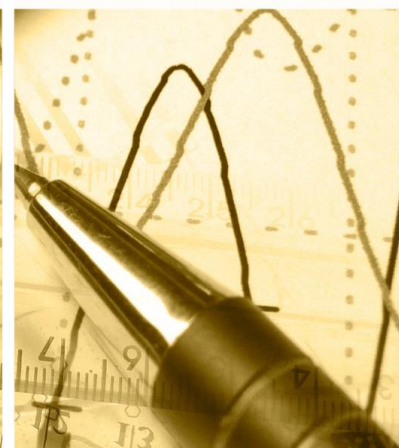
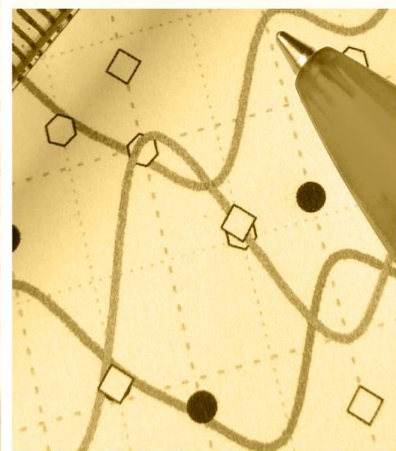
an export vehicle for both local and newly formed enterprises in the Island.

The newness of such instruments and their recent implementation means that any analysis of their impacts may well be premature, since it usually takes five or more years for substantial effects to be observed in the economy. Nevertheless, this report has been able to highlight several direct effects of these incentives, which are expected to continue increasing during the next few years. To measure the impact of these laws on Puerto Rico's economy, the DDEC commissioned Estudios Técnicos, Inc. to carry out an economic impact study

Moreover DDEC uses other policy tools which seek to complement the incentives offered by Act 20/22. These other laws provide tax incentives to promote the International Financial Entities ("IFE's") (Act 273-2012), and the International Insurers and Reinsurers Act, which establishes the legal basis for the International Insurance Center of Puerto Rico (Act 399-2004). Through Act 399, insurance companies can export and import insurance and services related to the insurance industry. While Act 273 seeks to make Puerto Rico an international banking and financial center by providing tax incentives for banking and financial services provided to clients outside of Puerto Rico. Law 73 of 2008 is the legislation that provides a wide range of incentives mainly related to manufacturing, but provided an initial basis for a transition from manufacturing to a service economy.

This document describes the methodology used to pursue the economic impact of tax incentive laws, the legal and economic background, data gathering procedures, economic impact analysis, economic impact forecasts and recommendations.

BACKGROUND



Legal Background

During 2012, two laws were enacted to promote the transfer of investors to Puerto Rico and to incentivize export of services from the Island. These laws have been known as Act 20 and Act 22. Even though both policy tools are administered by the DDEC and have been promoted together, their core tenets vary substantially.

Act 20-2012: Tax Incentives to Promote Export Services in Puerto Rico

This law applies to companies established in Puerto Rico that export services to jurisdictions outside the Island. Act 20-2012 arises from an analysis which demonstrated the comparative advantage of Puerto Rico in foreign markets. The Island's competitive edge is particularly strong in the provision of advanced services such as: information technology and communications, project management, financial services and business support services, among others.

This initiative provides substantial tax incentives for businesses that wish to establish or expand their operations by exporting services from Puerto Rico. Companies that hold an Act 20 decree will benefit from:

- 4% fixed income tax rate on export service activities.
- 3% fixed income tax rate in the case of services considered strategic and over ninety percent (90%) of all gross income of the entity that carries out the eligible business and its affiliated entities is derived from the provision of services for export.
- 100% tax exemption on distributions from earning and profits.
- 90% tax exemption from real and personal property taxes related to property used in eligible activities.

Businesses who perform centralized management services, shared services and call centers benefit from 100% exemption.

- 60% tax exemption on municipal taxes (90% tax exemption if business operates within the municipalities of Vieques and Culebra).
- No federal taxes on Puerto Rico source income

To obtain a decree under Act 20, a person who has established or proposes to establish an eligible business in Puerto Rico, may request the benefits by filing the corresponding duly sworn application with the DDEC's Office of Industrial Tax Exemption (OITE).

The following are the activities eligible to receive benefits under the Act:

- Research and development
- Advertising and public relations
- Consulting services
- Creative industries
- Production of blueprints, architectural and engineering services, and project management
- Professional services such as legal, tax and accounting services
- Centralized management services
- Centers for electronic data processing
- Development of licensable computer software
- Voice and data telecommunications between persons located outside of Puerto Rico
- Call centers
- Shared services centers
- Storage and distribution centers
- Educational and training services

- Hospital and laboratory services
- Investment banking and other financial services
- Promoter services
- Commercial and mercantile distribution of products manufactured in Puerto Rico for jurisdictions outside Puerto Rico
- Assembly, bottling and packaging operations of products for export
- Marketing centers
- Trading companies

In terms of the effective period of the incentives, the law provides that once the service provider is officially granted the decree, tax rates will be secured for the 20 year term, irrespective of any changes in the applicable Puerto Rico tax laws. The decree may be eligible for a ten year extension.

To maintain accountability with respect to the performance of the program, most decree holders will annually file a report no later than thirty (30) days after the filing of the corresponding income tax return. This report shall contain data that shows compliance with the conditions set out in the decree for the immediately preceding taxable year, including average employment generated by the services covered by the decree and other performance measures.

Act 22-2012: Individual Investors Act

Act 22, as amended, provides significant incentives to individuals who decide to relocate to Puerto Rico, and establish their residence here. So far the incentives have attracted new capital investments in the real

estate and financial sectors, although there have been investments in other sectors.

This Act applies to individuals, who have not been residents of Puerto Rico for the 6 year period³ prior to January, 2012. To benefit from the law, the individual needs to become a bona fide Puerto Rico resident. For the purposes of the law, a resident of Puerto Rico means a person who is present for at least 183 days during any tax year⁴. All program participants from December 1st, 2015 and onwards will be required to acquire a residential property and a bank account in Puerto Rico⁵.

Tax exemptions include:

- 100% tax exemption on interest and dividend income received by Resident Individual Investors during the Exemption Period. The exemption applies to all sources of such income.
- In the case of long-term capital gains, the Act provides for either a full Puerto Rico income tax exemption or a reduced tax rate of 5%, depending on meeting certain requirements
- No federal taxes on Puerto Rico source income

In order to benefit from the incentives provided in this Act, every Resident Individual Investor must request from the Secretary of Economic Development the issuance of a tax exemption decree pursuant to this Act, by filing a duly sworn application before OITE.

Once the individual is officially granted the incentives, such benefits become an agreement between the Government of Puerto Rico and the individual. The maximum

³ Initially, when the Act was enacted, the required period was 15 years.

⁴ IRS definition of bona fide resident. Act 22 has other requirements intended to guarantee that Puerto Rico

is the principal place of residence for the resident individual investor.

⁵ Per an amendment introduced in Act 187-2015.

term for the agreement ends in December, 2035.

Also, since the December 2014 amendment, every resident individual investor who holds a decree granted under this Act, shall file an annual report not later than April 15 of each year⁶. During 2013, the annual report was

required as a condition in the decree, all decrees awarded prior to the enactment of this requirement, are not obliged to file the report. To assess the program's performance, annual reports contain data that reflects compliance with the conditions set out in the decree for the taxable year immediately preceding the date of filing.

Overall Methodology

The report's methodology uses a multivariate approach, which essentially entails the use of various research methods (including primary and secondary research) to gather data and validate results. An additional test for quality control identifies outliers and estimates margin of errors.

Data was initially gathered from DDEC's database system (which will be described below), data was then validated with DDEC personnel, and also measured against individual data points, gathered from interviews with Act 20/22 service providers and other key industry informants⁷. Yet, the main information source of the report relied on empirical evidence gathered from annual reports and decree applications.

To capture the complete spectrum of Act 20/22 information, ETI developed a hybrid approach which combined data from annual reports⁸ (being the most accurate

source of information) and complemented that data with information provided by decree holders (grantees) in the application form⁹. Hence, for all approved decrees with no annual reports, the information was obtained from the application form. In order to create a unified database of DDEC's applications and annual reports, information was validated, merged and standardized. Generally, applications will offer a wider set of data points, since applicants are required to provide financial, legal and operational information about their businesses and investments before a decree is granted.

It is important to note that not all fields under the annual report can be complemented with the applications. In some instances both data objects do not coincide. Therefore, some of the analyses in the report utilize the hybrid approach, and other will depend on the tendencies reflected in the applications or annual reports exclusively. This condition is

⁶ A thirty (30) day extension may be granted.

⁷ The data gathering sections provides a detailed description on both quantitative and qualitative data.

⁸ Annual reports are considered more accurate data points since information is not estimated or expected, but rather is actual data from the previous taxable year.

⁹ In some instances decree applicants provided yearly estimates on financial and economic performance

indicators. Since data is not uniform among all decree numbers, ETI's analytical tools were programmed to look for data initially in the annual report, and secondly in the application form. This programming allowed for a complete integration of both databases. i.e. when data point was not available in the annual report the system traces a comparable data field in the application form. Overall this increases the accuracy of the estimates.

particularly relevant for Act 22 for which reports vary substantially from applications.

Economic Impact Methodology

To estimate the economic impact ETI developed a series of econometric tools that gauge employment, fiscal revenues, investment and consumer spending. As will be explained in each section of the report, every Act has its own set of procedures to determine the economic impact in Puerto Rico's economy. This is particularly important, since both laws are usually perceived as similar policy tools. However, in economic terms both Acts utilize different incentives and thus, produce different impacts in the economy.

The methodology employed for Act 20 follows the procedures used for an economic incentive program which targets businesses established in Puerto Rico and which plan to export services to other jurisdictions, including the U.S. This diverges from Act 22 which is focused on attracting foreign individual investors¹⁰ and the diaspora, into the local economy.

There are several ways to measure the economic impact of export activities, yet, most of the analysis will focus on a few

economic variables which have tangible effects in the economy such as sales volume, value added per GDP, wealth creation in the form of property values, personal income and job creation. All these measures (if positive) serve as proxies for improvements in the economy's well-being. Nonetheless, these estimates cannot be equated with a cost-benefit analysis¹¹, which will require a different methodological approach and its inconsequential for these type of incentive program. It is important to note that these measures are overlapping. Thus, when determining the aggregate economic impact, measures cannot be simply added.

On the other hand, the methodology used for determining the impact of foreign investment usually incorporates the economic literature of *Foreign Direct Investment* (FDI). This type of analysis centers on econometric tools at the aggregate national level with no particular consideration to individual investment efforts, which is the focus of Act 22. Thus, the methodology employed in this report combines the concept of FDI with a particular focus on individual private investments. The studies developed around individual private investment, such as those¹² regarding the US EB-5 Visa program¹³ are

¹⁰ The term foreign investor should be exclusively equated to individuals with low linkages with the Island; subsequent amendments to the law changed from 15 to 6 years the amount of time an individual has to be living outside the Island in order to benefit from the incentives. These changes have provided greater opportunities to the diaspora of young professionals.

¹¹ Incentive programs such as Act 20/22 provide non-cash transfers via forgone income, with a marginal state investment in the institutional infrastructure already in place. Since both programs allow for the creation of new economic activity within the Island, and exogenous variables, such as changes in foreign markets, are not considered, a cost-benefit analysis has no practical application. A cost-benefit analysis entails a wider consideration of factors to determine net effects in the economy. i.e. societal and

economic costs of economic activity created by the incentive programs and the benefits created within different areas of the economy. On a purely economic basis this could mean analyzing any potential displacement in already established economic activity.

¹² MIG, Inc., Economic Impacts of the EB-5 Immigration Program 2010-2011. June 7, 2013.

¹³ The EB-5 Visa program was designed for foreign nationals willing to invest in the US (usually in the above-\$500,000 range), and includes a variety of incentives for foreign investment, local purchasing of supplies, and catering to the U.S.A. market. An important difference with the Law 22 program, however, is that this visa program is not based upon

particularly relevant. It is important to note that several decree holders (grantees) have combined their incentives from Act 22, with those from Act 20, by moving their business operations to Puerto Rico. Yet, the methodology employed has standardized the data to guarantee that economic values are not double counted when these circumstances are present.

Variables such as employment, investment (mostly real estate), consumer spending and fiscal revenues¹⁴, will be used to assess the overall impact in the economy. For salaried workers employed by the investors, a salary characteristic of their respective occupations (if available) will be imputed. Household spending for investors and their hired employees will also be estimated so as to determine consumption-based taxes and their spending-side impact upon the economy. It is important to point out that the economic impact of these investors goes

beyond mere household spending, as these investors purchase vehicles, properties, other durable goods, and generate indirect economic activity as a result of these purchases. Whenever possible, these spending patterns will be taken into account in the estimation and forecasting analysis.

Economic multipliers will be used to determine direct, indirect, and induced employment produced by Act 20 businesses. These estimates will have an aggregate impact on GNP that can be determined using a labor input-share analysis upon the relevant industries. Additionally, population forecasts will be used to determine potential employment in the following years, as well as economic impact derived from their expectations.

A detailed description of the econometric methodology employed in the estimates will be explained in the *Forecasts section*

Data Gathering

Quantitative Data

To understand the sources of data available, interviews were conducted with personnel from the DDEC, OITE and the agency's information technology consultants. Currently, the DDEC has three sets of data related to Act 20 and Act 22 beneficiaries:

- Applications – All beneficiaries are required to submit an application requesting a decree that contains the most information. However, data must be analyzed as proposed or potential

impacts estimated with no specific timeframe.

- Decrees – Is the agreement between the Commonwealth and the Act 20/Act22 beneficiary. Per DDEC's database, information is limited, but contains accurate data on the actual number of beneficiaries per program.
- Annual reports – An annual report constitutes the most accurate representation of recent economic activity of program beneficiaries; completeness, accuracy and uniformity of data was enhanced for the purposes of this report. Both Acts have different

tax incentives for the investors, their incentives a directly related to an immigration status.

¹⁴ Estimates of the tax revenue generated from personal income, and sales taxes

requirements in terms of annual reports. Act 20 requires annual reports to be filed 30 days after the tax return filing date. On the other hand, Act 22 reporting requirements will vary depending on the date of issuance of the decree. Act 22 decrees granted before mid-2013 are not required to submit annual reports.

Data was gathered using DDEC's web based system call CRM (a Customer Relationship Management tool created on Microsoft Dynamics). This platform is used by grantees to submit decree applications and also to submit their annual reports. Simultaneously, DDEC personnel use this tool to manage and monitor both programs. Estudios Técnicos' team was granted access to the system, so as to gather the necessary data to assess the economic impact of both programs. Additional efforts have been made to obtain data filed prior to the establishment of the platform. It is important to note that a migration process was undertaken at the DDEC prior to the development of CRM. This process transferred most of the information from hardcopy files into the web-based system. As described in the *addendum* some of the limitations inherent to the data are intrinsically related to this process. Thus, a great deal of emphasis was placed on

obtaining high-quality data and developing adequate control measures.

Act 20 Statistics

As of November 2nd, 2015, there were 360 Act 20 decrees approved¹⁵. Out of the total approved decrees only 160 decrees had the responsibility to file an Annual Report due to their business' commencement of operation date. A total of 129 had submitted annual reports (complete) by the time of this report. To bridge the gap between available information from annual reports and the total number of decrees, data was also gathered from decree applications. The methodology further explains this procedure.



Act 22 Statistics

As of November 2, 2015, there were 574 Act 22 decrees approved.¹⁶ According to DDEC's database, only 133 reports were presented for taxable year 2014.¹⁷ The difference between decrees and annual reports is partially attributed to grantees which did not have the obligation to file due to amendments to the enabling Act and the time allowed in the decree to formally

¹⁵ Out of 360 decrees, only 160 were required to file an annual report for taxable year 2014, based on the commencement of operations date and according to the information provided by OITE. According to CRM, data obtained on November 2, 129 reports were presented for taxable year 2014. This amount excludes any canceled and incomplete reports, as well as 3 decrees which had annual reports with more than one status (i.e. filed + pending filing). As of November 2, of the 160 decrees that have the responsibility to file annual report for the taxable year 2014, 101 were filed. Also, another 28 reports were voluntarily filed. Voluntarily filed refers to those companies which had no obligation to file a report due to the commencement of operations date.

¹⁶ Out of those 574, around 137 were required to file an annual report for taxable year 2014, according to the information provided by OITE.

¹⁷ This amount excludes any canceled and incomplete reports, as well as 3 decrees which had annual reports with more than one status (i.e. filed + pending filing). Of the 137 decrees that have the responsibility to file annual report for the taxable year 2014, 75 were filed, as of November 2. Also, another 58 reports were voluntarily filed. Voluntarily filed refers to those companies which had no obligation to file a report due to the commencement of operations date.

establish residence in Puerto Rico. Furthermore, annual reports were adjusted to guarantee that decree holders with spouses were not double counted if both family members were decree holders. Also, reports were adjusted for decree holders which had both Act 20 and 22, and thus could have a potential double counting in the operational business analysis.

Regarding applications, there are several pending cases which are in transit to approved decrees. For instance, around 159 applications have been filed, but are not yet approved, and another 101 applications are in process in CRM, but have not been properly filed.



Data processing

To develop a uniform data set, information from applications, decrees and annual reports was generated using CRM. Reports (applications, decrees and annual reports) obtained from CRM provided all data, as self-reported by the grantee. These individual files were consolidated in order to gather the greatest amount of information for each case, using the decree/case number, used as the unique identifier.

Application forms and annual reports template capture multiple data fields. Yet, a set of data points which are relevant for assessing the economic impact of both laws was selected. During the data merge, some fields were included or excluded to guarantee consistency and/or minimize duplication. For instance, individuals under Act 22, whose spouses are also decree holders, and who have businesses with Act 20 decrees.

A preliminary analysis of CRM data demonstrated various limitations mostly due to incomplete data and lack of uniformity. For instance:

- Data is self-reported and thus cleanup was required.
- The forms, and systems used to capture the data have changed over the years, thus subject to submission date, different data fields are included.
- Since there are no required fields in the application and annual report templates, some information is missing in CRM.
- Data related to the service type, as well as other fields, required a standardization procedure. Partially due to the fact that the system does not provide a set of alternatives to choose from.

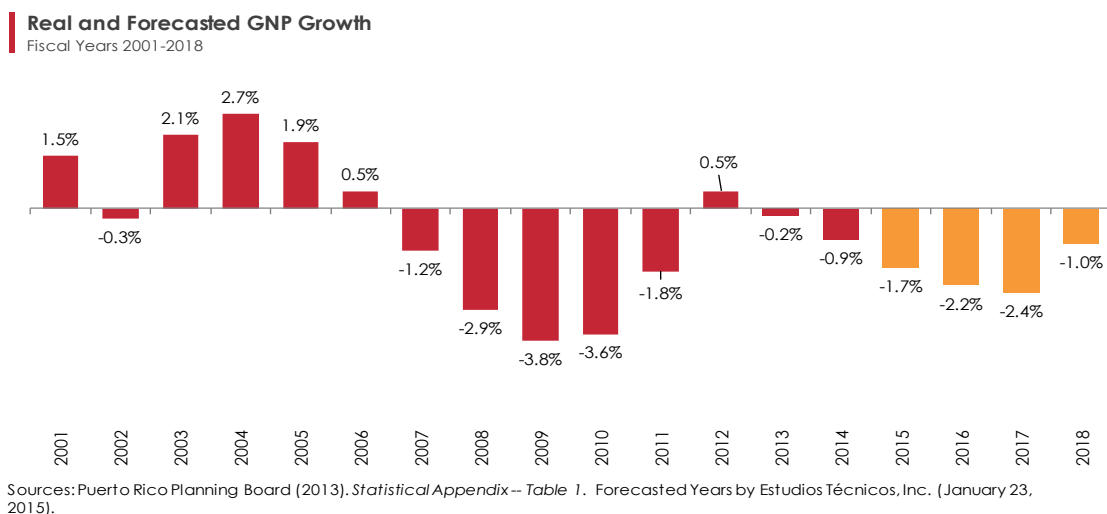
The report includes a section solely dedicated to the information gathered from applications and reports and how to develop adequate performance measures.

Economic Background

GNP and Economic Growth

With the exception of 2012, Puerto Rico hasn't registered positive economic growth since 2006. Given the fiscal situation, public spending is expected to see substantial declines in the coming years. The recession has begun to impact personal consumption,

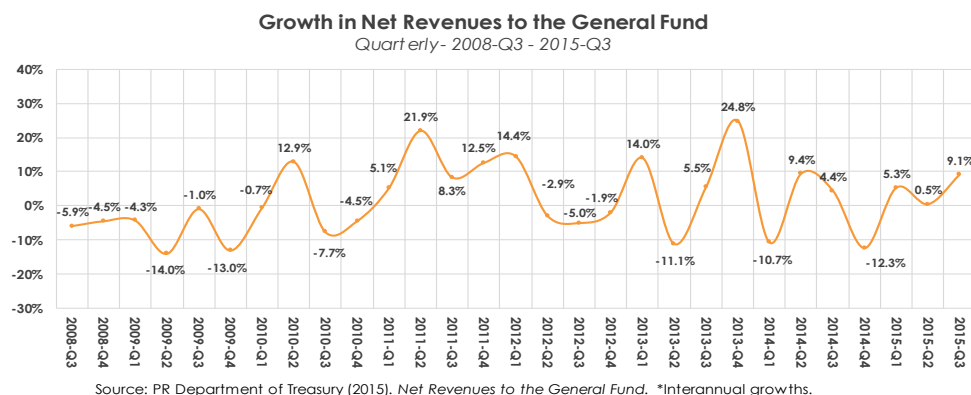
which for the first time since 2009 declined in 2014 (-2.6%). Estudios Técnicos has projected negative growth until the end of the decade. The Island currently faces reductions in Medicare and Affordable Care Act funds which could force the reduction of health benefits for many of the Island's elderly and low income residents.



General Fund Net Revenues

In October of 2015 general fund revenues were 99.7% of estimated revenues. Even with the positive news regarding revenues the Department of the Treasury has revised its 2015 revenue estimate down by \$354 million.

Revenues were higher in the first quarter of fiscal 2016, yet October reflected a 7.3% decline in revenue. The increase in the sales tax that went into effect on July 1st is expected to bring in an additional \$1,111.7 million in revenue to the General Fund.



Recent Fiscal Events

To address short-term liquidity problems, emergency cuts and self-financing measures had to be enacted. The greatest of these is a \$400 million internal Tax Revenue Anticipation Notes (TRANs) issue, which will be purchased by SINOT, ACAA and the State Insurance Fund.

Other measures include delays on tax refund payments and payments to suppliers, reorganization of government agencies and restructuring their payment and service-providing processes, and privatization/suspension of AMA routes, including reducing Sunday services. For

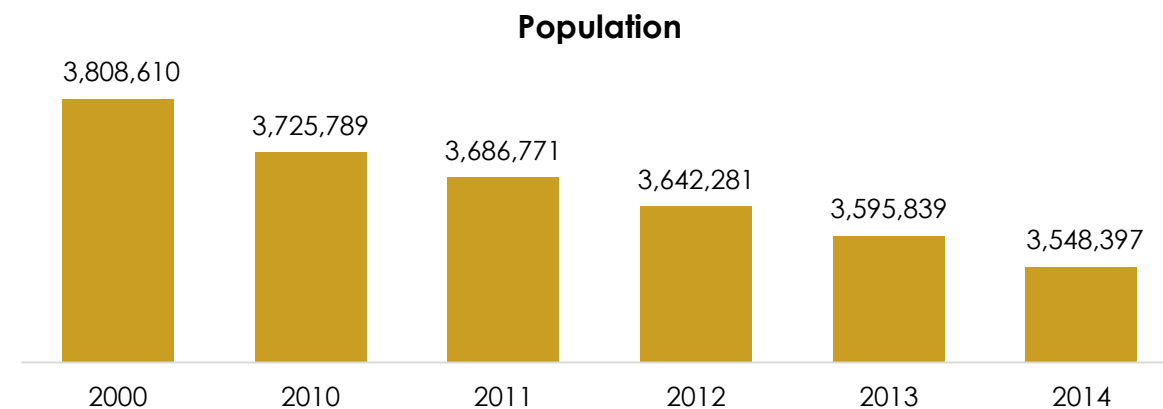
additional liquidity, an agreement is in process for the Retirement fund to pay their part of the retirement pensions owed in July and October directly, instead of these being paid by the General Fund.

Even with these measures the necessary liquidity needed for the first half of fiscal 2016 was not acquired. This has increased the risk of additional emergency measures being taken to address the lack of liquidity. These measures could have adverse effects on economic activity as they contemplate a full or partial government shutdown, a reduction of the working day for public employees, or default of further instruments.

Migration

Net Migration since 2010 reached over 200,000 people in 2014. According to the *Cumulative Estimates of the Components of Populations Change*, approximately 218,137 people migrated from Puerto Rico during the period from April 1, 2010 to July 1, 2014; 55,092 of which migrated during July 1, 2013

to July 1, 2014. The local population decreased 1.2% annually since 2010, reaching 3,548,397 inhabitants in 2014 – 177,392 persons fewer than the baseline Census estimate (3,725,789). The population estimates for 2012 and 2013 were also revised downward, to 3,642,281 and 3,595,839 persons, respectively.

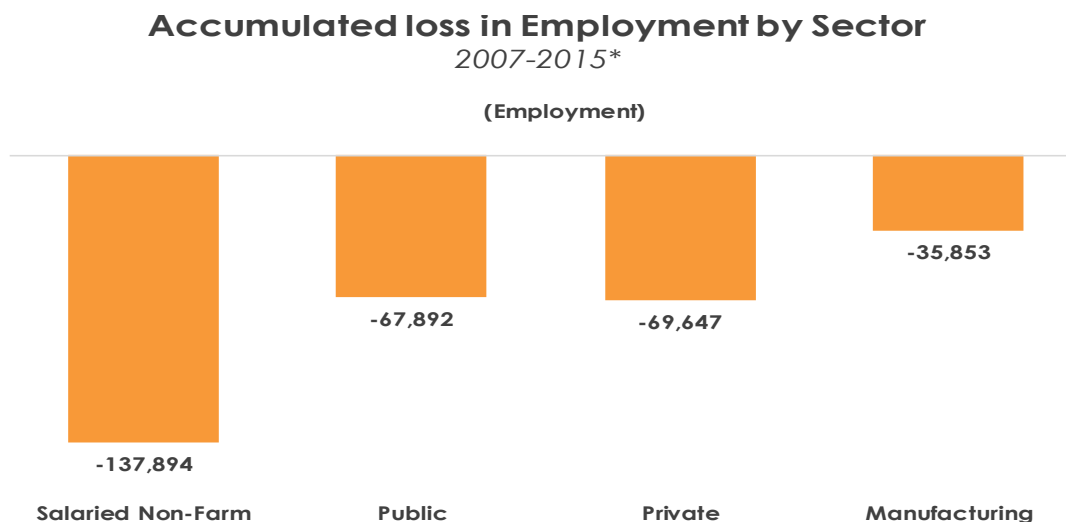


Sources: Census Bureau. Population. Population Census 2000 and 2010; Current population survey; Population

Labor Markets

Labor markets continue to downsize with the cumulative net loss of jobs reaching 137,894 employees between 2007 and 2015. Although salaried non-farm employment has increased since June on a year over year

basis, the cumulative loss of jobs reached 67,892 in the public sector and 69,647 in the private sector. Of the private employment losses, approximately 50% of the accumulated losses were from manufacturing employees.



Source: PR Department of Labor and Human Resources (2015). Current Employment Statistics, Salaried non-farm employment (adjusted for stationarity). *Until september

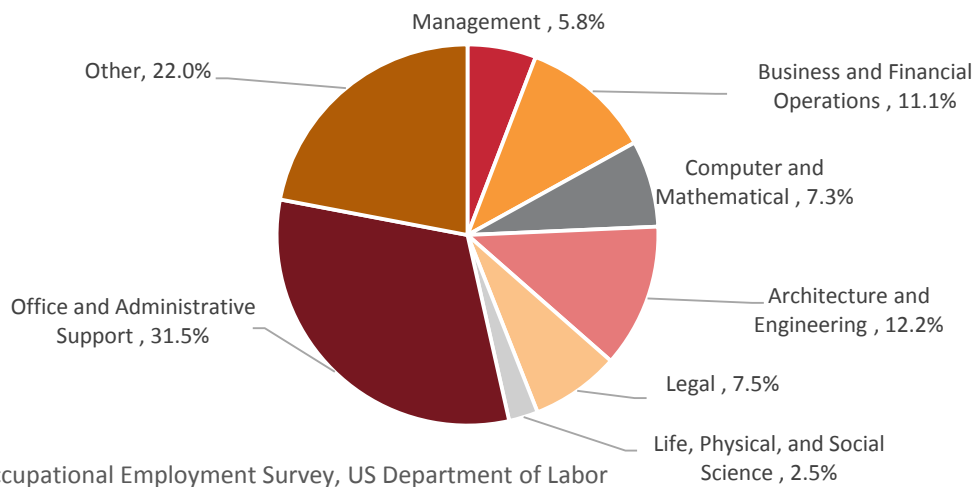
Occupation by Industry

Of particular importance is the employment in the technical services industry as many investors that take advantage of laws 20 & 22 belong to these occupations. Employment in this industry has increased between 2012 and 2014 by 6.4%, from 26,990 to 28,720. This increase could be reasonably attributed to the passage of Acts 20 & 22, since there few other policy measures specifically targeting these sectors. This is an impressive growth rate

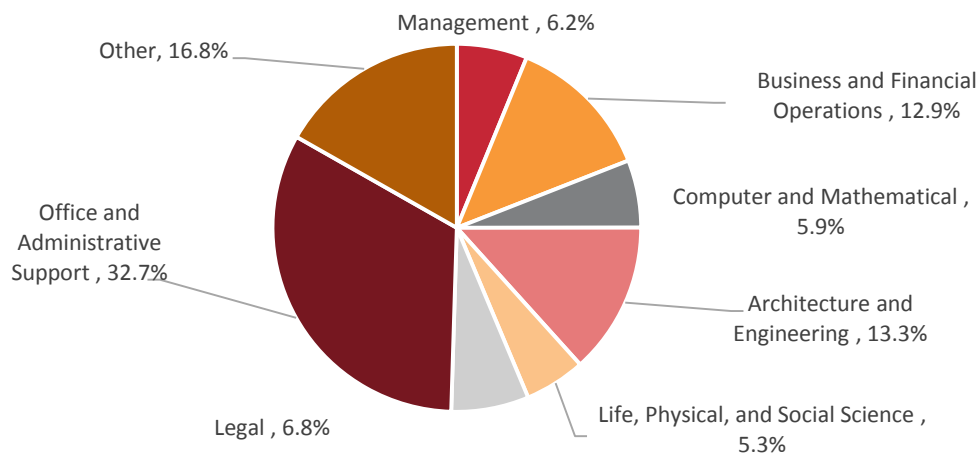
given the fact that total salaried non-farm has been declining as presented in the previous section.

Office and administrative support has registered an increase, in 2014 it represented 32.7% of employment in the technical services industry up from 31.5% in 2012. Architecture and engineering, and business and financial operations have also slightly increased and represent the second and third occupation respectively.

Employment in Technical Services Industry by Occupation 2012



Employment in Technical Services Industry by Occupation 2014



Construction Industry

Construction activity has remained in contraction or stagnant since 2008. In the second quarter of 2015 construction permits stood at 33% of their 2008-Q3 total. This decline in investment highlights the need for

foreign investment in key sectors of Puerto Rico's economy.

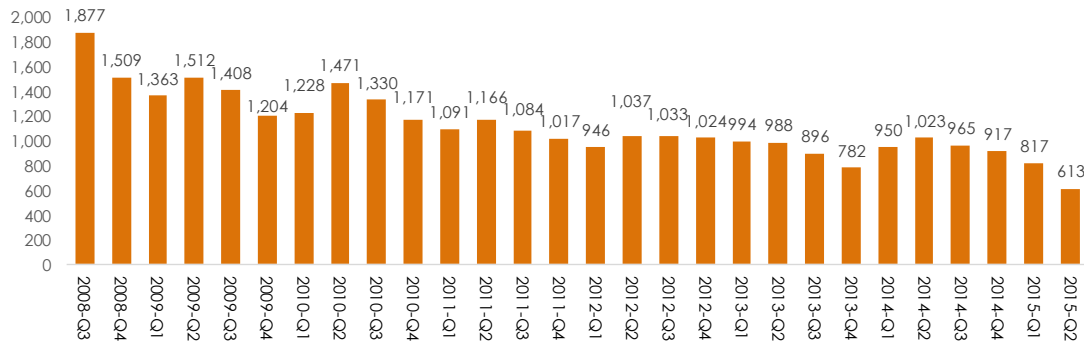
In recent trends, following a short period of moderate growth, construction permits resumed their decline. Cement sales continued declining in inter-annual terms.

After a sustained increase in construction permits from 2014-Q2 to 2015-Q1, the number of construction permits decreased by 10.8%

during the first two (2) months of 2015-Q2. Cement sales showed inter-annual declines of 11.9% in 2015-Q1 and of 5.4% in 2015-Q2.

Number of Construction Permits

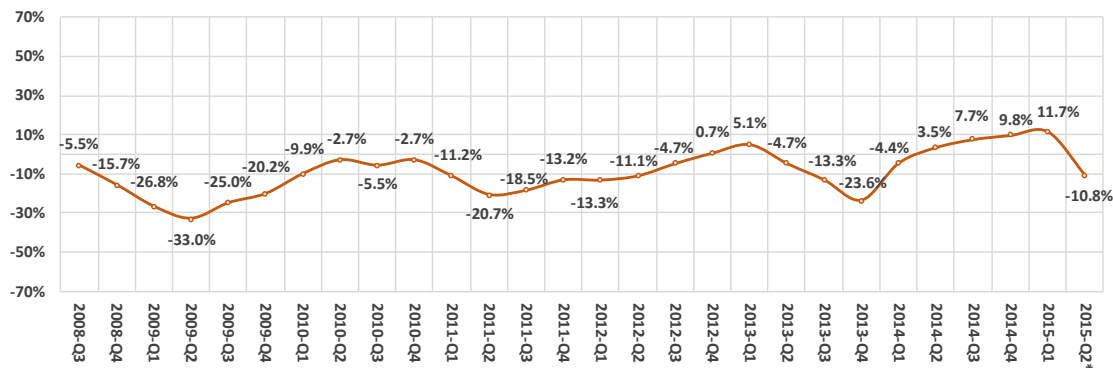
Quarterly--2008-Q3 - 2015-Q2



Source: PR Planning Board (2015). Number of Construction Permits (total). *Up until May 2015.

Growth in Number of Construction Permits

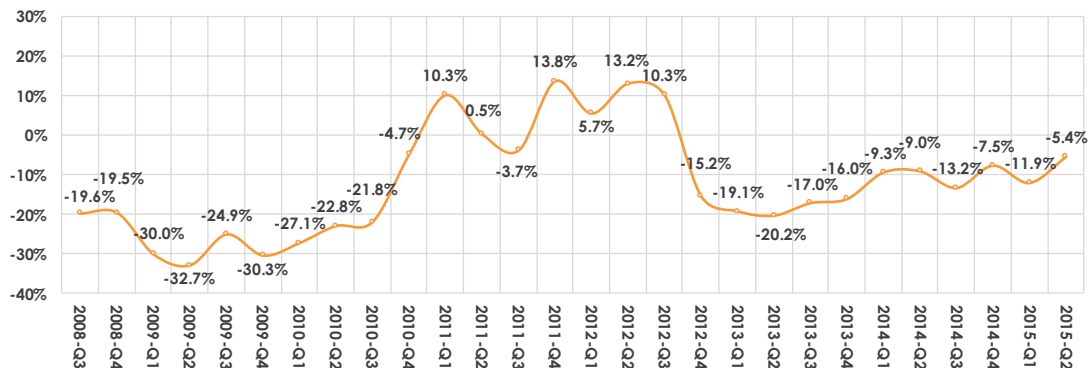
Quarterly -- 2008-Q3 - 2015-Q2*



Source: PR Planning Board (2015). Number of Construction Permits (total). *Interannual growth of the first two (2) months of 2015-Q2. **Interannual growths.

Growth in Cement Sales

Quarterly-- 2008-Q3 - 2015-Q2



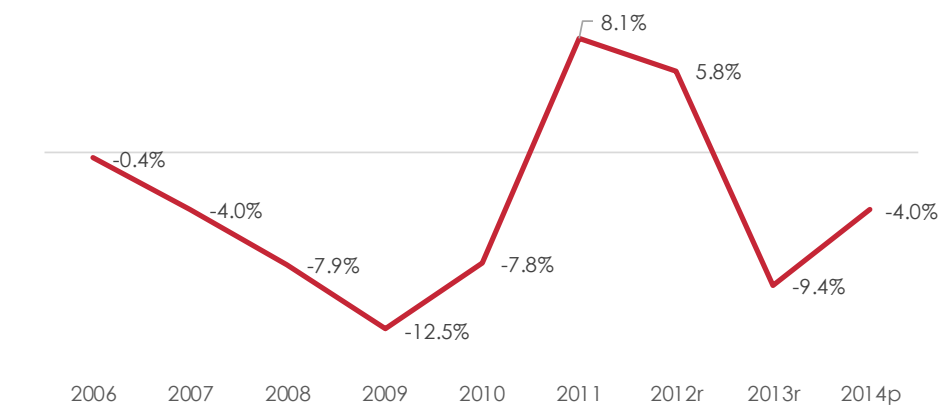
Source: PR Planning Board (2015). Cement Sales (thousands of 94lb sacks). *Interannual growths.

Gross Domestic Investment

Investment has declined in the past two years, and is now 29% or \$559.4 million below the 2006 total. Gross domestic investment is projected to continue to fall in the coming years as public spending declines. This generates a need for foreign private

investment to help mitigate the negative effects of budget cuts in the coming years. Acts 20 and 22 could be used as tools to attract foreign investment and generate local employment. Investors could also contribute to the general fund, as their economic activity would generate tax revenue.

Gross Domestic Investment Growth



Sources: PR Planning Board (2014), Statistical Appendix.

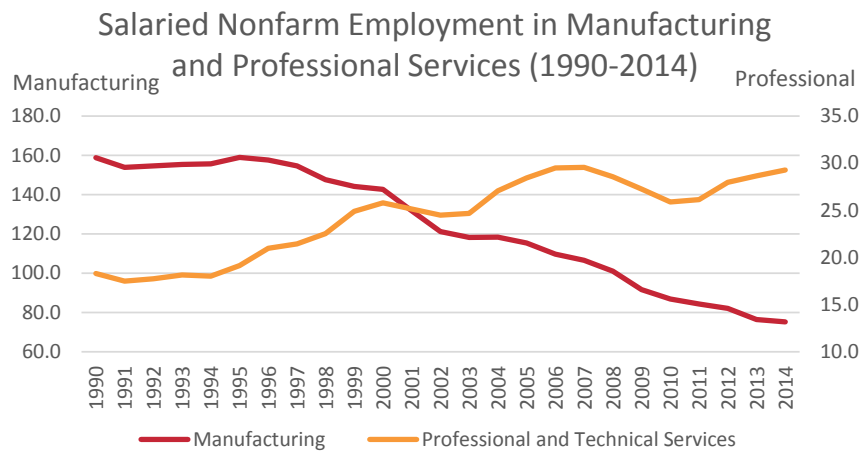
The following sections present the current state of the professional and technical services sector. This is one of the main sectors affected by Act 20 and 22. Although this has been a traditionally small sector within the Puerto Rican economy, it has been one of the few that has registered growth in

employment in the past years. The local economy is dominated by the manufacturing sector which represents 47% of the GDP. Yet, measures must be taken to diversify the economy and incentivize growth in sectors that have strong growth potential.

Employment in Key Economic Sectors

In the past 25 years manufacturing employment in Puerto Rico has seen a consistent decline. During the same period professional services employment increased almost continuously with the exception of the

mid 2000s due in part to the beginning of the recession. Although employment has been growing in service industries, it has not been enough to compensate for the loss in the manufacturing sector. The graph below presents salaried nonfarm employment for the period between 1990 and 2014.



Source: PR Department of Labor and Human Resources, Salaried nonfarm employment.

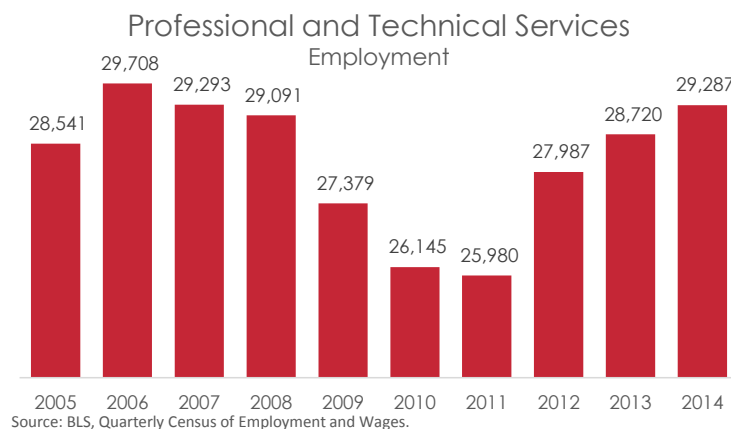
This represents a shift in the employment available in Puerto Rico, given that is one of the few sectors that has registered significant growth, it implies that this type of work should be promoted and incentivized. Act 20 and 22, when applied together, help attract individuals and businesses which help

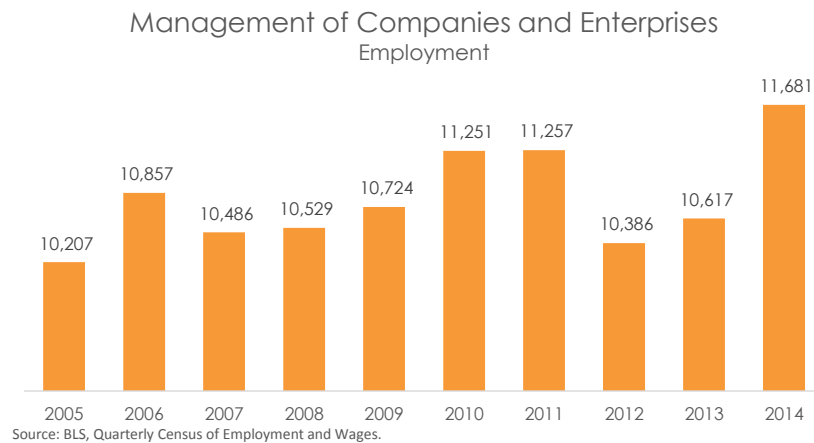
generate more employment in this growing sector. In the following sections the Professional and technical services sector as well as the management of companies and enterprises sector are presented. It is in these sectors that the majority of Act 20 and 22 beneficiaries should be classified.

Employment in Professional and Technical Services

According to data from the Quarterly Census of Employment and Wages, employment in professional and technical services has been steadily increasing since 2011. In 2014 employment stood at 29,287, slightly below the 2006 high of 29,708 but 12.7% higher than

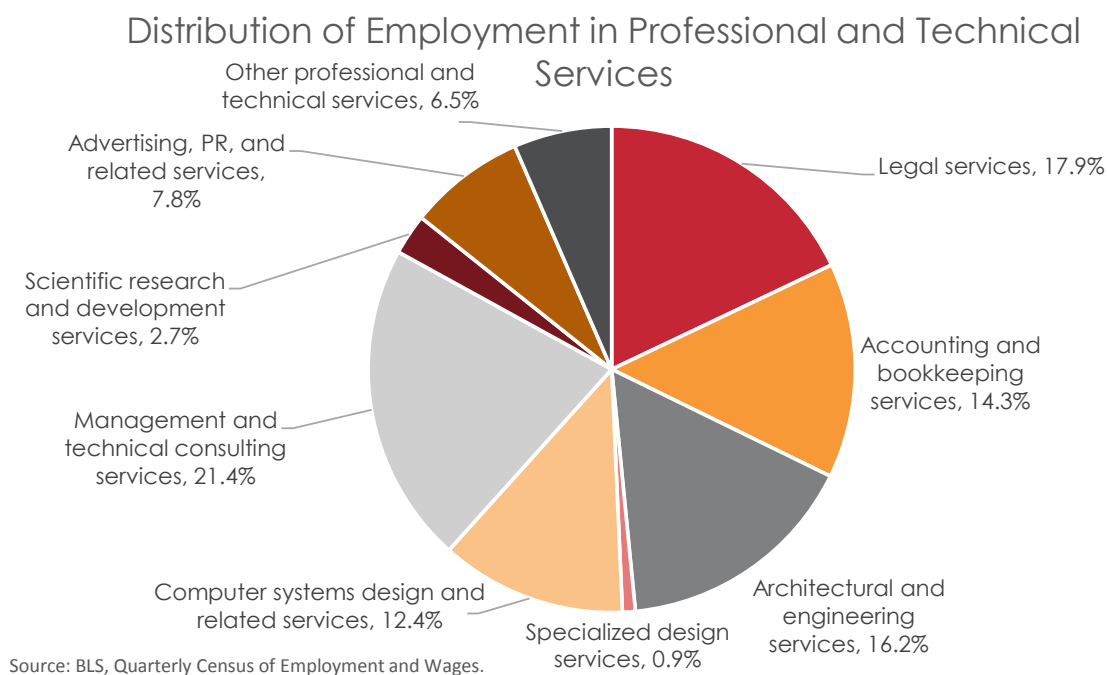
in 2011. Employment in management of companies and Enterprises registered a 12.5% with respect to 2012, and in 2014 stood at 11,681. Professional services employment includes all services classified under NAICS sector 54 which includes: architectural, engineering, scientific, design, and publicity services among others.





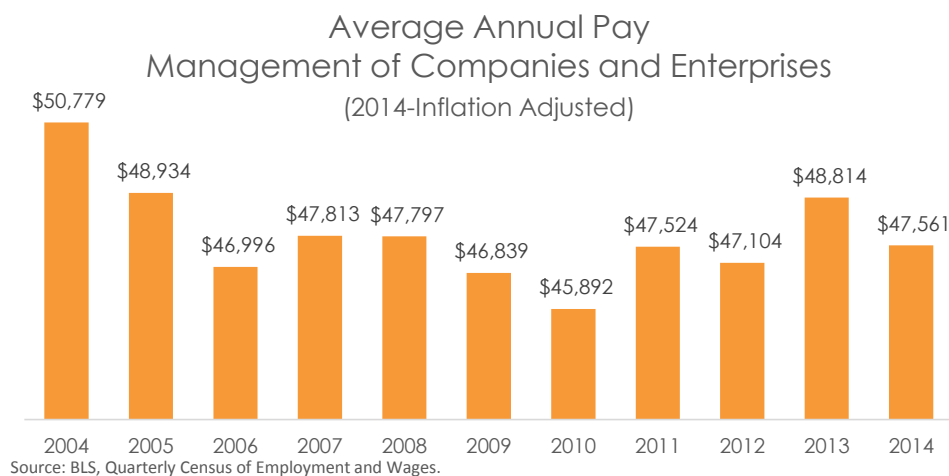
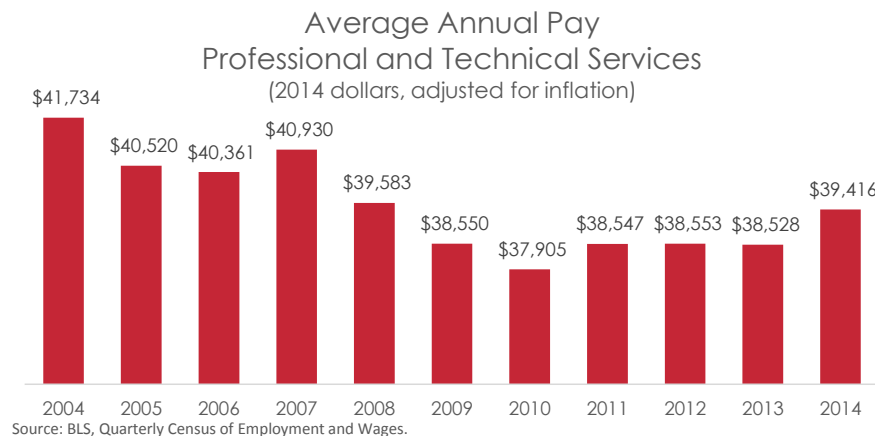
In 2014, employment in Professional and Technical services, concentrated primarily in management and technical consulting services with 21.4% of all sector employment. This was followed by legal services with 17.9% and architectural and engineering services with 16.2%. Computer systems design and

related services is the only other classification to represent more than 10% of employment in the sector. As more beneficiaries of both acts arise, a small shift in the distribution of professional and technical services employment could be observed.



Wages in the professional and technical services sector have remained stagnant in the past decade, the lowest point coming in 2010 when the average annual salary was \$37,905. The average pay presented in the following graph has been adjusted for inflation and is presented in 2014 dollars to facilitate the comparison between the years. To adjust for inflation, the Consumer Price

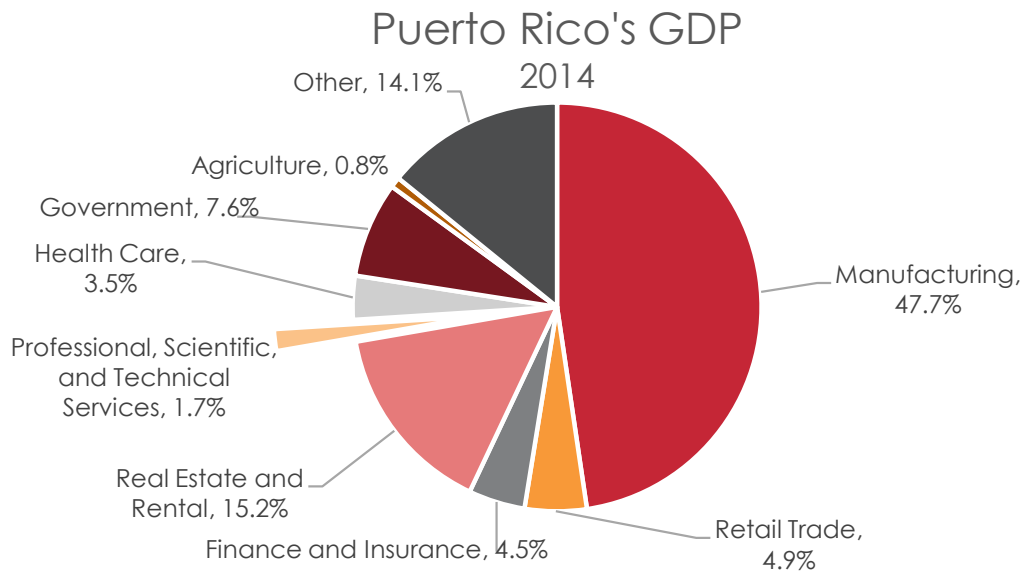
Index for Puerto Rico was used. In 2014 the average pay was up to \$39,416, this is around \$2,300 below its 2004 high. The average annual pay for management of companies and enterprises in 2014 stood at \$47,561, up from the 2010 low of \$45,892. The average annual pay for management of companies and enterprises is also presented in 2014 dollars.



GDP by Sector

In 2014 professional and technical services GDP reached \$1,783.1 million, which represents 1.7% of Puerto Rico's GDP.

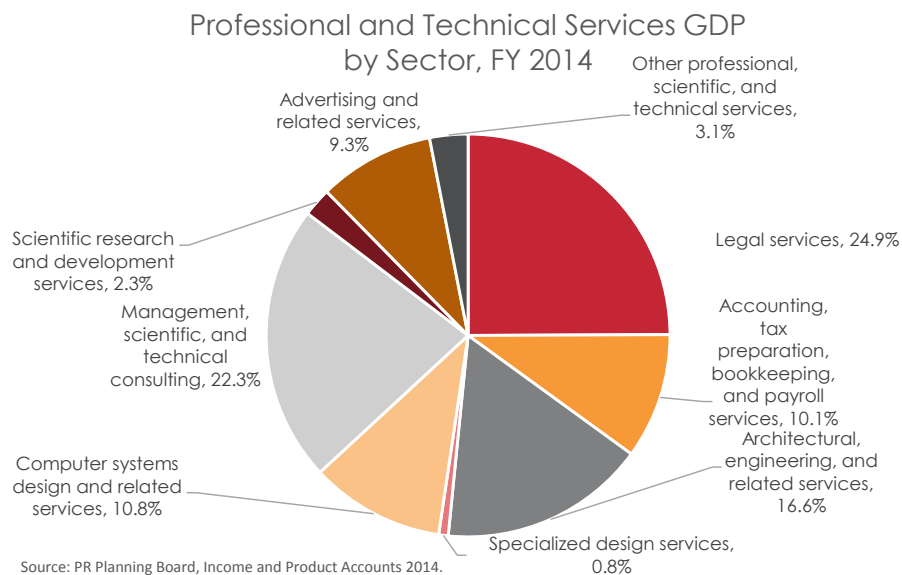
Manufacturing represents nearly half of the Commonwealth's GDP, this is followed by the real estate and rental sector with 15.2%, and the government with 7.6%.



Source: PR Planning Board, Income and Product Accounts 2014.

Legal services comprise 24.9% of the professional and technical services sector, followed by management, scientific, and technical consulting with 22.3%. Architectural, engineering, and relative services was the third biggest sector with 16.6% and computer

systems design and relative services totaled 10.8%. The smallest sector reported was specialized design services. This is another distribution that could change in the coming years thanks to law 20 & 22.



Source: PR Planning Board, Income and Product Accounts 2014.

Summing up

The economy's state calls for a wide ranging set of actions that will generate investment, stimulate the construction sector and provide the basis for development of an advanced services sector with export potential. Both Law 20 and Law 22 address these needs. Although difficult to quantify a number of beneficiaries of both laws have begun programs to improve the Island's capabilities in activities such as programing, knowledge management and C& IT in

general. This was made clear in a number of the interviews. The above overview of the economy and some of its main sectors is included to emphasize the need for initiatives that provide stimulus to investment and economic activity in general. The current outlook of the local economy requires actions which stimulate local production beyond domestic demand. In this respect, both incentive programs will contribute to a more robust service sector and thus, higher exports.

Data Analysis and Results for Act 20

Since the validation of accuracy of the data reported to the DDEC, the conclusions of the study are solely based on reported data.

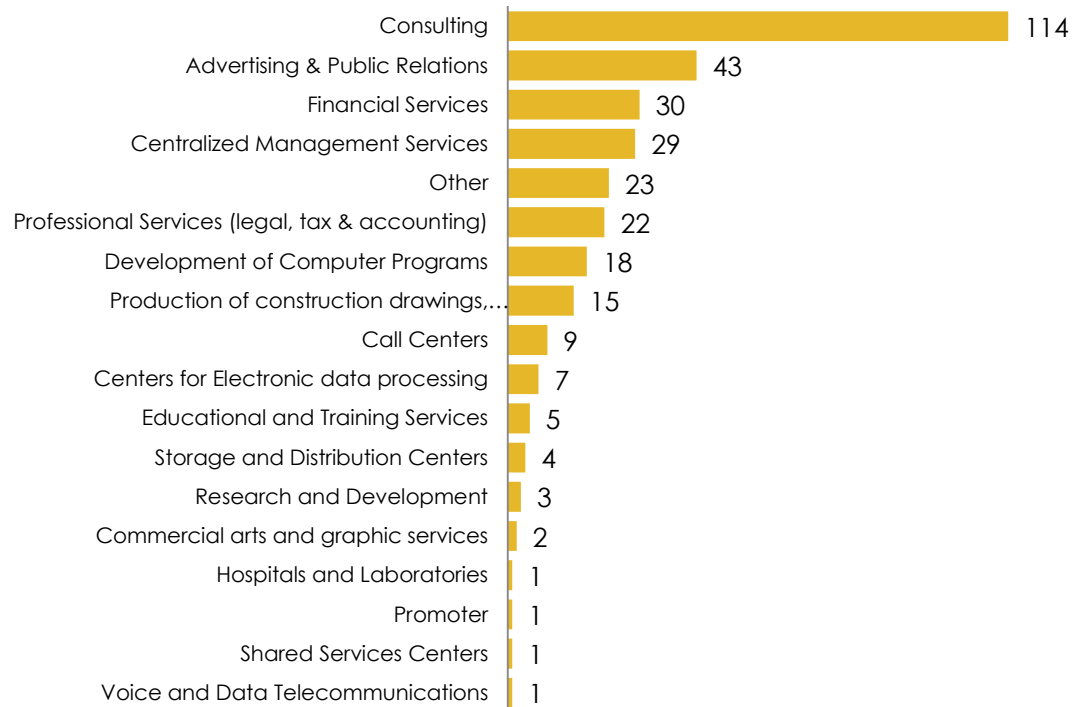
However, appropriate distinctions have been placed when describing results based on proposed accomplishments as reported in applications, rather than actual accomplishments, as informed in annual reports.

Profile of Grantees

The analyses presented throughout the section are based on a total of 360 decrees for Act 20. Note: The total decree numbers do not take into account pending cases for 2015. Estimates from DDEC include close to 204 additional decrees from decree applications which are in the process of approval. Decrees by year will not add to the total, since 10 decrees didn't have an approval date.

Year	Decrees
2012	33
2013	47
2014	121
2015	149
Total	360

In terms of the structure, the report provides an initial description of the decrees and their particular annual reports, complemented with certain sets of information from the application form, originally submitted by each decree holder. As outlined in the data gathering section, certain caveats influence the results of this report, yet the data has been interpreted following a representative sample - type of approach- in which the annual reports that were gathered will be extrapolated to the universe of total annual reports.



* Only filed decree reported their main service type.

As noted in the above graph, most Act 20 companies selected Consulting as their main service type¹⁸. Nonetheless, a limited number of companies specified the type of consulting (i.e. economic, environmental, marketing, etc.). Of those who reported the type of consulting, most of them are related to financial services.

Advertising and Public Relations follows in second place when establishing the type of service. The number is relatively high due to the fact that these companies include several other services. When data is individually analyzed, only 11 companies are

solely dedicated to advertising and public relations. The other 32 companies reported other business activities.

As noted in the graph, the services with the highest share are high-skill services in the areas of business, advertising, accounting, management and legal services. Production of computer programs is the 7th highest. These are usually associated with high value-added activities.

Due to the way the information is obtained from applicants there is no data field indicating if the company is a local business

¹⁸ The number for Act 20 service type is estimated based on the percentage of type of service established in the annual report and application. Information was also validated using the main service type established in the decree. It is important to note that decree holders can select several service types and thus, one

company could have multiple services. The company's main highest allocation for a particular service was used to determine the decree's main service.

or a recently established business from abroad. Applicants were asked to inform if they were performing eligible services in Puerto Rico prior to obtaining a decree¹⁹. If one assumes that a local business will most probably perform an eligible service in Puerto Rico prior to obtaining a decree, then, it could be argued that close to 20% of Act 20 grantees are local businesses and close to 80% of applicants are from other jurisdictions. This is only a proxy since there is a chance that foreign businesses could be performing eligible activities in Puerto Rico prior to a decree, among other plausible scenarios.

Based on the information provided in the annual reports, the following table illustrates the top export services destinations. Due to Puerto Rico's trade integration with the US more than half of exports are destined to the US market. The Dominican Republic and Mexico follow in second and third place respectively. Beyond the top 20 destinations below, others include: New Zealand, British Virgin Islands, Costa Rica, Trinidad & Tobago, Netherlands, Ecuador, Bermuda, France,

Guatemala, Curacao, Japan, Taiwan, Denmark, Aruba, Tortola, Dubai, Argentina, Bahamas, South America, Estonia, Hong Kong, St. Kitts, St. Lucia, Antigua and Haiti. The results illustrate that almost 2/3 of the export market is concentrated in the USA, but the remaining 35% is wide spread around the world.

Top 20 Export Destinations			
#	Export Destinations	Frequency of Export Destinations	Share
1	USA	238	65.9%
2	Dominican Republic	13	3.6%
3	Mexico	7	1.9%
4	United Kingdom	6	1.7%
5	Colombia	6	1.7%
6	Grand Cayman	6	1.7%
7	India	5	1.4%
8	Germany	5	1.4%
9	China	4	1.1%
10	Spain	4	1.1%
11	Venezuela	4	1.1%
12	Brazil	4	1.1%
13	USVI	3	0.8%
14	St. Marteen	3	0.8%
15	Australia	3	0.8%
16	Panama	3	0.8%
17	Canada	3	0.8%
18	Peru	3	0.8%
19	Russia	3	0.8%
20	Ireland	3	0.8%

Employment

Two of the main indicators of economic impact are total employment and investment, this is particularly relevant for Act 20 grantees since export services generate high-quality employment opportunities and generate high value-added investments. Using a hybrid approach (combining applications and annual reports) ETI estimated the average potential impact of Act 20 decrees. The information is

segregated between eligible and non-eligible activities, yet, most of the results and analyses are based on the overall economic activities performed by the grantees. As highlighted in the following tables, Act 20 companies had a bigger share of eligible employees, thus, data suggest that most firms are a direct result of Act 20 incentives.

Using the hybrid approach, data shows that annual payroll averages close to \$43,000 per

¹⁹ Question per Act 20 Application: "Base Period Income (BPI) – Specify whether Applicant, Stockholder, Member or any Affiliated Entity or Predecessor Business (both as defined in the Act and the

Regulations promulgated thereunder) is presently performing, or was performing, in Puerto Rico the eligible activities subject of this Application: "

job, and businesses had a total payroll of \$137.2 million. When compared to Puerto Rico's average salary for all private and public sector jobs (\$27,510), Act 20 companies almost double that figure. This salary level is closely related to the high value-added nature of services provided under the incentive program.

Payroll	Average Salary*
\$137,185,589	\$42,601

*Average salary for both eligible and non-eligible employment

Source: DDEC, Input-Output Matrix 2002

The Direct, indirect and induced employment generated by Act 20 companies account for a total of

7,033 jobs

The payroll figures represent close to 3,349 direct jobs that are generated by Act 20 companies. These direct jobs in turn, helped to generate 2,163 indirect jobs and 1,520 induced jobs. The Direct, indirect and induced employment ²⁰ account for a total of 7,033 jobs. This estimation was carried out using the Input-Output Matrix for Puerto Rico (2002). Given the diversity of work offered by Law 20 beneficiaries the multipliers for the service sector were used to estimate the impact of employment.

Total Employment

Direct	Indirect	Induced	Total
3,349	2,163	1,520	7,033

Source: DDEC, Input-Output Matrix 2002

²⁰ Basic definition of multipliers effect: Direct – refers to new economic activity directly linked to the incentive program. Indirect – refers to business growth in suppliers of program beneficiaries. Induced – additional spending in the economy as a consequence of direct and indirect businesses. i.e.

Out of the 3,349 jobs created, 40% corresponds to non-eligible activities which were performed by program participants. Such non-eligible activities are considered due to the inability to determine if a portion of Act 20 companies are dependent on their non-eligible activities to maintain their eligible activities. Therefore, the non-eligible components are assumed to arise as a result of the eligible work. That is, that non-eligible work is still taking place in Puerto Rico and exists due to Act 20, even if it doesn't reap the benefits of the law.

Estimated Impact of Law 20 Firms in Puerto Rico

Actuals and Averages of expected 3-year investment schedules, by concept

Number of Employees	3,349
Eligible	2,200
Non-Eligible	1,149

Following the profile for Act 20 companies – in which most grantees are performing consulting services - the services with the highest share of new employment opportunities are also concentrated in consulting services. Nonetheless, advertising and public relations, call centers, architectural and engineering services, accounting and management services, also account for a substantial share of employment. In terms of highest salaries per employee, Centers for Electronic data processing, financial services, development of computer programs and centralized management services, reflect the highest compensation. On the other end, call

additional spending from workers and payroll. (consumer expenditure) *The above assumes continuation of local inter-industry trade patterns and local flows of money.

centers provide the lowest salary per employee but holds the second largest portion of new employment opportunities.

If differences between service types are not considered, the average number of jobs per decree is close to 9.3 jobs. Based on information from applications and validated via interviews with local services providers and key industry informants, most of the contracting is done locally (87% of total employment is local), yet certain activities will have a higher propensity for local hiring, particularly if skill sets are less specialized. It is

important to note that contrary to manufacturing incentives, the performance of Act 20 incentives cannot be measured only via employment creation, but rather on the long-term effect of technical knowhow - which spurs innovation - and the internationalization of the local service sector.

**The average number of jobs per
decree is close to**

9.3 jobs

**Law 20 Employment, Total Payroll and Average Payroll by Type of Eligible Economic Activity
2014**

Type of Activity	Eligible Activities			Non Eligible			Total		
	Employment	Total Payroll	Payroll / Employment	Employment	Total Payroll	Payroll / Employment	Employment	Total Payroll	Payroll / Employment
Centers for Electronic data processing	34	\$3,221,830	\$95,935	--	--	--	34	\$3,221,830	\$95,935
Centralized Management Services	170	\$10,391,987	\$60,980	4	\$1,142,777	\$79,371	174	\$11,534,763	\$66,133
Financial Services	72	\$4,686,259	\$65,314	15	\$790,880	\$34,881	87	\$5,477,138	\$63,137
Development of Computer Programs	58	\$3,147,283	\$54,031	20	\$1,447,361	\$44,728	78	\$4,594,644	\$58,906
Professional Services such as legal tax and accounting	114	\$4,053,118	\$35,424	130	\$9,094,302	\$12,917	245	\$13,147,420	\$53,736
Consulting	434	\$19,868,556	\$45,806	513	\$28,362,906	\$49,826	946	\$48,231,463	\$50,971
Other	171	\$7,636,650	\$44,724	127	\$6,992,436	\$0	298	\$14,629,086	\$49,173
Production of construction drawings, architectural and engineering services and project management	124	\$5,815,262	\$46,897	62	\$2,850,811	\$126,865	186	\$8,666,073	\$46,654
Hospitals and Laboratories	2	\$67,063	\$44,709	--	--	--	2	\$67,063	\$44,709
Voice and Data Telecommunications	6	\$161,750	\$29,409	20	\$883,383	\$0	25	\$1,045,133	\$41,391
Commercial arts and graphic services	3	\$90,016	\$30,005	1	\$71,601	\$0	4	\$161,617	\$40,404
Research and Development	5	\$185,450	\$37,090	--	--	--	5	\$185,450	\$37,090
Promoter	--	--	--	8	\$289,602	\$60,073	8	\$289,602	\$36,200
Shared Services Centers*	3	\$86,000	\$34,400	--	--	--	3	\$86,000	\$34,400
Advertising and Public Relations	241	\$8,908,728	\$36,966	85	\$1,794,199	\$0	326	\$10,702,927	\$32,831
Educational and Training Services	19	\$456,220	\$24,012	1	\$49,868	\$0	20	\$506,088	\$24,992
Storage and Distribution Centers	21	\$706,782	\$33,260	61	\$846,270	\$0	82	\$1,553,052	\$18,882
Call Centers	595	\$9,752,061	\$16,390	103	\$3,420,180	\$89,424	698	\$13,172,240	\$18,865
Total	2,071	\$79,235,015	\$38,259	1,149	\$58,036,574	\$50,500	3,220	\$137,271,589	\$42,628

Source: Data provided by the PR Department of Economic Development (2015). *Imputed based on the application, as the only firm in this sector reported 0 payroll in the annual report. This imputation was not considered for the total estimates.

Investment²¹

The results on initial investment show that most of the investment is concentrated in real estate and machinery and equipment. This is typical of businesses which are establishing new operations in the Island. This validates the fact that most businesses – as previously mentioned – are new foreign companies establishing their operations in Puerto Rico. If businesses were mostly local, one should expect less intensity in terms of real estate investments and equipment, particularly since local businesses can maximize their current real estate space and business operations. Furthermore, since these figures do not consider that businesses initially rent when entering a new market, bigger investment in real estate is to be expected as companies settle down in the ensuing years. As noted in the table, total investment is close to \$143 million. This means that Puerto Rico's economy has benefited from an injection of productive capital of almost \$70 million when

real estate and machinery & equipment are added up. It is reasonable to expect a greater spillover effect to the local economy in both, the construction industry, and the equipment required for the type of businesses established.

Estimated Impact of Law 20 Firms in Puerto Rico

Actuals and Averages of expected 3-year investment schedules, by concept

Investment	\$142,860,166
Real Estate	\$30,960,811
Machinery & Equipment	\$34,966,974
Other Assets ²²	\$76,932,381

Total investment is close to

\$143 million

Potential Income and Taxes

Act 20 companies have reported total revenues of almost \$1.2 billion. The share of eligible and non-eligible activities follows the same tendency as in the payroll information. That is, total revenues from eligible activities are substantially higher than revenues from non-eligible activities. Again, data confirms that most companies are export oriented businesses benefiting from the incentives promulgated in the law; thus, it could be

understood as a proxy for new economic activity.

**Total revenues of almost
\$1.2 billion**

The table below shows that companies had an aggregate net income of \$387 million of both eligible and non-eligible activities, which provides fiscal revenues of almost \$34.3 million in the form of corporate income taxes. Even though financial data is limited,

²¹ Average financial and operational estimates reported in 3-year projections combined with actual results from annual reports

²² The way the information is compiled in the annual reports do not allow for a breakdown of which assets comprise the total figure of *Other Assets*.

the levels of net income against total revenues highlight a highly profitable group of businesses with a good chance to keep their operations running in the Island. That is to say, that data is not showing a sector in decay which may compromise future fiscal revenues from the incentives program.

While information for municipal tax paid was limited to annual reports, and no information is provided in applications, a simple linear estimate shows that almost \$2,292,195 have been paid in municipal taxes²³.

**Almost
\$2,292,195
have been paid in municipal taxes**

Companies operating under this scenario are expected to have wider spill-over effects in the local economy via outsourcing on

local businesses and new potential ventures formed within the eligible services. This tendency provides a positive signaling to other local economic actors, which could tap into new foreign markets, not dependent on domestic demand.

Operating Information of Law 20 Firms

Actuals and averages of expected 3-year operational schedules

Total Revenues	\$1,210,450,634
Eligible	\$1,069,871,898
Non-Eligible	\$140,578,736
Total Expenses	\$788,751,495
Eligible	\$718,827,049
Non-Eligible	\$69,924,446
Corporate Income Tax Paid	\$34,349,691
Eligible	\$30,887,461
Non-Eligible	\$3,462,230
Net Income	\$387,349,447
Eligible	\$320,157,388
Non-Eligible	\$67,192,060

Other Fiscal Revenues

Being an incentive program focused on businesses, the biggest share of the total economic impact emanates from business activity, however, other areas of the local economy benefit from the revenues of these services. Among those one could highlight personal income tax from Act 20 employment and the sales tax from the consumption activity of such individuals. It is important to note that other sectors of the economy will also produce additional fiscal revenues, and these are subject to change depending on public policy.

Act 20 companies reported a total payroll of \$137.1 million and an average salary of \$42,301; with this salary employees would have paid an estimated individual income tax of \$17.6 million annually, under the current tax system²⁴. Services such as consulting, centralized management services, architectural and engineering services, and advertising and public relations paid the highest amount of individual income tax. These companies either have high salaries or a large total payroll.

²³ Act 20 has a special provision for municipal taxes which could be pushing down the total amount.

²⁴ Income tax paid was based on the 2014 income tax rates, with the first \$20,000 being tax exempt.

**Estimated individual income tax of
\$17.6 million
annually**

Following the previous analysis, half of the salary net of income tax was then multiplied by 7.0% to determine the SUT/VAT paid. This estimate is based on the fact that only around 50% of all consumption is subject to SUT/VAT. This totals \$3.6 million on sales tax paid by the employment created under Act 20 beneficiaries.

**\$3.6 million
on sales tax**

The table below summarizes the total fiscal contribution that is directly linked to Act 20. As noted in the table, Act 20 alone has generated close to \$60 million in tax revenues. Almost 60% of all revenue is concentrated in direct business activity from corporate income taxes, however, since salaries from Act 20 businesses are relatively

high, individual income tax represents close to 30% of all tax revenues.

**Act 20 alone has generated close to
\$60 million
in tax revenues**

Potential Fiscal Revenues

Tax Revenue Estimate	Total Taxes
Corporate Income Taxes	\$34,349,691
Income Taxes	\$17,628,243
Sales Taxes	\$3,555,070
Municipal Taxes	\$2,292,195
Total	\$57,825,199

Estimated Individual Income Tax Payable by Employees in Eligible and Non-Eligible Activities

2014

Type of Activity	Tax Payable in Eligible	Tax Payable in Non-Eligible	Total Individual Income Tax Payable
Consulting	\$3,019,602	\$4,082,829	\$7,102,430
Production of construction drawings, architectural and engineering services and project management	\$897,055	\$2,060,941	\$2,957,996
Call Centers	\$0	\$2,170,315	\$2,170,315
Centralized Management Services	\$1,982,518	\$70,810	\$2,053,328
Advertising and Public Relations	\$1,145,092	\$0	\$1,145,092
Other	\$1,142,495	\$0	\$1,142,495
Financial Services	\$937,308	\$63,454	\$1,000,762
Centers for Electronic data processing	\$778,081	\$0	\$778,081
Development of Computer Programs	\$544,061	\$132,168	\$676,229
Professional Services such as legal tax and accounting	\$499,549	\$0	\$499,549
Promoter	\$0	\$90,674	\$90,674
Storage and Distribution Centers	\$81,283	\$0	\$81,283
Educational and Training Services	\$33,281	\$0	\$33,281
Research and Development	\$23,913	\$0	\$23,913
Voice and Data Telecommunications	\$13,790	\$0	\$13,790
Shared Services Centers*	\$10,275	\$0	\$10,275
Hospitals and Laboratories	\$10,031	\$0	\$10,031
Commercial arts and graphic services	\$9,034	\$0	\$9,034
Total	\$11,127,367	\$6,500,876	\$17,628,243

Sources: Data provided by the PR Department of Economic Development (2015). PR Treasury Department (2015). Income Tax 2014 Instructions, p. 16.

Estimated Sales and Use Tax Payable by Employees in Eligible and Non-Eligible Activities

2014

Type of Activity	SUT Payable in Eligible	SUT Payable in Non-Eligible	Total SUT Payable
Consulting	\$562,587	\$810,712	\$1,373,298
Other	\$216,840	\$233,477	\$450,317
Professional Services such as legal tax and accounting	\$118,654	\$303,659	\$422,312
Call Centers	\$325,621	\$41,733	\$367,354
Advertising and Public Relations	\$259,228	\$59,908	\$319,136
Centralized Management Services	\$280,792	\$35,793	\$316,585
Production of construction drawings, architectural and engineering services and project management	\$164,219	\$26,374	\$190,593
Financial Services	\$125,177	\$24,289	\$149,466
Development of Computer Programs	\$86,922	\$43,914	\$130,836
Centers for Electronic data processing	\$81,597	\$0	\$81,597
Storage and Distribution Centers	\$20,885	\$28,257	\$49,142
Voice and Data Telecommunications	\$4,940	\$29,496	\$34,437
Educational and Training Services	\$14,122	\$1,665	\$15,787
Promoter	\$0	\$6,642	\$6,642
Research and Development	\$5,394	\$0	\$5,394
Commercial arts and graphic services	\$2,704	\$2,391	\$5,095
Shared Services Centers*	\$2,528	\$0	\$2,528
Hospitals and Laboratories	\$1,904	\$0	\$1,904
Total	\$1,948,493	\$1,606,577	\$3,555,070

Sources: Data provided by the PR Department of Economic Development (2015); PR Treasury Department (2015); Rules for Implementing the Dispositions of Subtitle D - Sales and Use Tax of Law 1 of January 31, 2011.* Value based on imputed payroll from application.

Overall Impact in the Economy

As an incentive program that promotes the development of new export activity, Act 20 provides new dynamism to Puerto Rico's economy. Export activities, particularly in the service sector, have large positive externalities in the local economy. As presented in the section describing Puerto Rico's service economy, the service industry shows a growing tendency vis-a-vis manufacturing activity, and other sectors in the local economy.

In general, the service economy has high degree of mobility –less machinery/facilities and more human resources- and thus, allows for faster tangible effects in the economy. Moreover, the potential for new knowhow and its spillover effects can propel new economic activity. The fact that Act 20 companies are concentrated in high-value added services, with highly specialized skill sets, means that the local economy can participate in a more competitive market with potential technology transfers.

To what extent this is achieved will depend on Puerto Rico's capacity to develop strong linkages with foreign firms and propel local management to seek target markets beyond the domestic demand. As previously mentioned, contrary to manufacturing incentives, the performance of Act 20/22 incentives cannot be measured only via employment creation, but rather on the long-term effect of technical knowhow -

which spurs innovation - and the internationalization of the local service sector.

As illustrated in the abovementioned results, Act 20 companies have directly created/retained over 3,000 jobs since their enactment. These jobs are predominantly high-skill and provide a direct link with foreign businesses and international markets. This exemplifies both, an opportunity to increase the local knowhow and also the potential internationalization of local businesses. Since Puerto Rico has an ample service economy, incentives are naturally in place for Act 20 businesses to capture local services and increase their productivity.

In terms of the effects in the Gross National Product (GNP), Act 20 economic impact in the form of revenues could represent close to 1% of Puerto Rico's GNP for 2014. Taking into account the limited time the incentive program has been in place, the total effect in GNP is relatively high when compared to other incentive programs such as the EB5 program in the USA²⁵.

Act 20 economic impact in the form of revenues could represent close to 1% of Puerto Rico's GNP for 2014

It is important to distinguish Act 20 from Act 22, particularly for the overall economic impact, since Act 20 provides a *level playing field* for all businesses within the Island while

²⁵ Several studies highlighting the effects of the EB-5 Program in the U.S. economy have estimated that the total economic impact of the program for a given year (2013) close to \$3.58 billion or 0.02% of U.S. GDP. Contrary to the incentives programs in Puerto Rico, the EB-5 program has been in place since 1990's. *The Economic Impact and Contribution of the EB-5*

Immigration Program (2013). IIUSA, Invest in the USA. May, 2015, P.5; EB-5 Program: Successes, Challenges, and Opportunities for States and Localities (Sept. 2015) Bipartisan Policy Center, P.19; Total U.S. GDP figures from International Monetary Fund, Report for Selected Countries and Subjects.

Act 22 is directed to individuals. What could in turn have an effect on local businesses, is the fact that a more competitive market will require local service providers to increase

their productivity. Additional policy tools will be required to create new market mechanisms that embed export services into the local ecosystem.

Data Analysis and Results for Act 22

Similar to the previous section, this analysis looks at the economic impact and benefits of law 22. However, the economic effects of

Act 22 will vary from those of Act 20, mainly due to the incentive structure. Act 22 provides incentives for individual investors and Act 20 tax incentives for export companies.

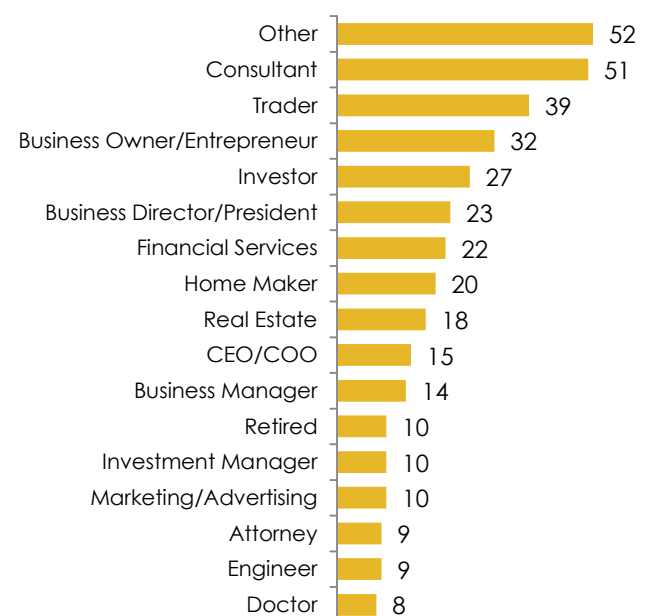
Grantee's Profile

As described in the data gathering section, for the purposes of this report, Act 22 has generated 573 approved decrees. The following figure illustrates the total number of decrees approved each year. At the time of the application a total of 344 grantees had a residence in Puerto Rico and 232 had a business established in the Island.

Year	Decrees
2012	18
2013	120
2014	262
2015	173
Total	574

Note: The total decree numbers do not take into account pending cases for 2015. Estimates from DDEC include close to 180 additional decrees from decree applications which are in the process of approval. Decrees by year will not add to the total since one decree did not have an approval date.

In terms of the main occupation identified by grantees, data shows that most grantees are consultants, traders within the financial industry, entrepreneurs and investors. Other occupations include attorneys, accountants, among others. Out of the total applications,



205 applicants did not state any current occupation.

To gauge the place of origin of decree holders the field of prior residence in the application was used as a proxy. Out of 573 decrees, 510 (89%) reported having their previous residence in the USA. The other 11% had previous residence in countries such as Venezuela, United Kingdom and Spain.

Country	Amount
USA	510
Venezuela	9
United Kingdom	6
Spain	3
US Virgin Islands	3
Uruguay	2
Dominican Republic	1
Canada	1
Hong Kong	1
Nevis	1
Brazil	1
Russia	1
BVI	1
Holland	1
Colombia	1
Italy	1
Monaco	1
Argentina	1
India	1
Unknown	27
Total	573*

* Information on previous residence could not be obtain for all decree holders.

In terms of their distribution within the USA, most grantees come from Florida, followed by Texas, California, New York and Illinois. Yet, participants have come from all other states of the Union with the exception of Delaware, Hawaii, Maine, Mississippi and New Mexico.

State	Amount
Florida, USA	73
Texas USA	62
California, USA	61
New York, USA	53
Illinois USA	20
USVI	18
Nevada, USA	16
Georgia, USA	16
Connecticut, USA	15
USA	15
Massachusetts, USA	15
New Jersey, USA	15
Arizona, USA	13
Pennsylvania, USA	11
Texas, USA	11
Colorado, USA	10
Washington, USA	9
North Carolina, USA	7
Virginia, USA	7
Maryland, USA	7
Kentucky, USA	6
Utah, USA	5
Oregon, USA	5
Ohio, USA	5
Other	46
Total	510

Participants provided information of their main type of activity in their annual reports. As in Act 20, participants' main business (52.5%) is consulting and financial services. Centralized management services and advertising and public relations follow in order. The fact that participants of both programs have a similar profile with respect to their business activity, evidences that promotional efforts targeted the benefits of using both laws together. It is important to note that not all Act 22 grantees reported having a business, thus, absolute numbers will not match the total number of decrees.

Distribution of Reports by Type of Business

Consulting	32.2%
Financial Services	20.3%
Other	11.9%
Centralized Management Services	8.5%
Advertising and Public Relations	5.1%
Call Centers	3.4%
Hospitals and Laboratories	3.4%
Non-Service Industry	3.4%
Storage and Distribution Centers	3.4%
Development of Computer Programs	1.7%
Management	1.7%
Production of construction drawings, architectural and engineering services and project management	1.7%
Professional Services such as legal tax and accounting	1.7%
NA	1.7%

Act 22 Economic Impact

Being an individual investor program, Act 22 has a strong economic impact in local real estate investments. The case of Puerto Rico has been particularly relevant since at the time of the enactment of the law, Puerto Rico had an excess inventory of high-value properties which had a very limited market within the Island. Using the hybrid approach (combination of applications and annual reports) ETI was able to estimate several aggregate data points which can be used to estimate the economic impact of Act 22 beneficiaries.

Information from property values shows that close to \$266 million have been invested in the local real estate market. The average property value ranged between \$1.1 and \$1.8 million. In terms of 1-year value of rent, estimates reflect a total of \$7.1 million. As initial investors mature in the local market, it is expected they will make a transition to purchasing local real estate²⁶. Moreover, with a subsequent amendment to the enabling Act²⁷, new investors are required to purchase a residential property within the Island.

This impact does not take into account other potential indirect effects of the program in

²⁶ Usually newcomers are more attracted to rental agreements due to the uncertainties experienced when entering a new market.

²⁷ Act 187-2015, "En las solicitudes de decretos que se radiquen a partir del 1 de diciembre de 2015, el Secretario requerirá a los solicitantes, como requisito

indispensable para otorgar los decretos aquí establecidos, que el Individuo Residente Inversionista adquiera una propiedad residencial en Puerto Rico y que abra una cuenta personal o de negocio en un banco o cooperativa con presencia en Puerto Rico."

the economy, such as new businesses that have been created to provide services to Act 22 beneficiaries. Moreover, other potential investors have created new investments in the Island, betting on the new

market that's been created due to these programs. This particular issue is partially measured in the data gathering section, under qualitative data and interviews to key industry informants.

Total Impact of Law 22 Individuals Hybrid (Application and Report)	
Planned Capital Investment	\$228,381,000
Percentage of Individuals with Established Businesses in Puerto Rico	52.29%
Expected Employment from Business Activity	2,483
Total Net Worth:	
Unspecified	22.3%
Less than 10 million	66.4%
10 million to 50 million	9.9%
50 million to 100 million	1.2%
More than 100 million	0.2%
Percentage of Capital Estimated to be Transferred:	
Unspecified	39.5%
0% - 25%	17.9%
26% - 50%	10.6%
51% - 75%	9.1%
76% - 100%	15.7%
Other	7.1%
Total Value of Currently Purchased Properties	\$266,333,025
1-year Value of Rent	\$7,145,856
Percentage of Individuals Making Other Investments	39.3%

Based on the information provided by the program participants, close to 66% had a net worth of less than \$10 million; only 10% had a net worth between \$10 and \$50 million. This means that their residential status in the island will create a bigger demand for consumer goods and services from local companies. Again, to maximize the economic benefits of this new capital, local businesses will need to adapt their services to the particular needs of such a market. Furthermore, individual spending in terms of consumer goods will have an impact in terms of fiscal revenues, but also with local businesses providing such goods.

Act 22 Applications do not hold information on expected consumer spending, hence Annual Report data was used to determine total consumer spending from Act 22 decree holders²⁸. The data from 133 annual reports totaled \$17,884,645. The average spending per decree was used to estimate the total potential spending for all decree holders, this amounts to more than \$73 million.

The total potential spending for all decree holders amounts to more than \$73 million.

On the other hand, these individual investors could have bigger effects in the economy if they develop new business ventures within the Island. i.e. buying commercial facilities will have an impact in the economy, yet, injecting new capital improvements to those facilities could have a wider economic impact²⁹. Act 22 grantees reported a total of \$228 million in capital improvements³⁰ and 52% had businesses established in Puerto Rico³¹.

Act 22 grantees reported a total of \$228 million in capital improvements

The business activity of these individuals generate close to 2,483 new jobs within the Island. These direct jobs in turn, helped to generate 1,604 indirect jobs and 1,127 induced jobs. The direct, indirect and induced employment³² accounts for a total of 5,214 jobs. This estimation was carried out using the Input-Output Matrix for Puerto Rico (2002). Given the diversity of work offered by

²⁸ Out of 574 decrees only 133 submitted annual reports in 2014. These annual reports had a particular field named "money spent in Puerto Rico".

²⁹ Construction for instance, has a high degree of *embeddedness* in terms of local intra-industry links.

³⁰ The initial estimate of \$214 million, excluded potential duplication from couples and Act 22 individuals which had an Act 20 decree. The exclusion intended to minimize any overestimation as a result of couples which reported the same capital investments, under different decree numbers; and also Act 22 individuals which planned capital investments for their Act 20 business. After further analysis, the information was individually analyzed to determine which couples had non-related capital investments and thus must be included in the final amount of total capital investments. Information was gathered directly from

Act 22 applications. This data field is not included in the Act 22 Annual Report.

³¹ This fact is further validated in the data, since 40% of grantees reported making other investments in Puerto Rico.

³² Basic definition of multipliers effect: Direct – refers to new economic activity directly linked to the incentive program. Indirect – refers to business growth in suppliers of program beneficiaries. Induced – additional spending in the economy as a consequence of direct and indirect businesses. i.e. additional spending from workers and payroll. (consumer expenditure) *The above assumes continuation of local inter-industry trade patterns and local flows of money.

Law 22 beneficiaries the multipliers for the service sector were used to estimate the impact of employment.

The direct, indirect and induced employment accounts for a total of
5,214 jobs

It is important to note that these jobs do not include employment generated by the consumption of services demanded by the household, such as domestic work or other incidental services required by a homeowner.

Qualitative Data

To supplement the data obtained from Act 20/22 decrees (applications and annual reports), several interviews were conducted with business leaders who have played key roles in the implementation and execution of these programs. This section is particularly relevant, as not all the direct effects of the incentives programs can be captured by DDEC reporting requirements for decree holders.

In terms of the profile of the informants, it was very diverse, and included consulting firms, real estate companies, financial institutions and non-decree holders with local investments. Some informants provided robust data on current and future investments and others provided insights on new ventures developed as a result of these programs, including the creation of new divisions and hiring new personnel to deal with the new clientele.

Information obtained from the consultations consists of data related to the general Act 20/22 decree holders' profile, their

The above employment figures represent jobs directly created by the Act 22 individuals and which exclude any potential overlapping with Act 20 jobs from individuals which hold decrees from both acts.

Total Employment			
Direct	Indirect	Induced	Total
2,483	1,604	1,127	5,214

Source: DDEC, Input-Output Matrix 2002

investments in Puerto Rico, and other facts concerning the overall impact of these laws.

In general, most of the interviewees agree that both laws have a positive impact in the Island's economy and contribute to develop new investment opportunities. Moreover, informants agreed that both, Acts 20 and 22, play an important role in marketing the Island as an investment location in U.S. and international markets. Nonetheless, some informants recommended the government to consider enacting additional policy measures that guarantee a level playing field, for both local and foreign investors.

As specified by informants, the highest influx of Act 20 and Act 22 applications was between the second semester of 2014 and the first semester of 2015. In their opinion, a decline in the number of persons interested in benefitting from these laws occurred during mid-2015, mostly due to the uncertainty arising from Puerto Rico's fragile fiscal situation.

Informants stated that Act 22 participants have very diverse profiles, not only in terms of net worth, but in terms of occupations and interests. Not all decree holders are "super

rich" as traditionally perceived, and they come from multiple cultural backgrounds and world regions. Mostly they are knowledgeable, highly educated individuals, who demand highly skilled services and high scale consumer products. This has generated an increase in the demand for specific products and services, particularly, organic products, high-end restaurants, concierge

services, healthcare related services, among others. This in turn could cause the emergence of new businesses in the Island to satisfy the demand of this sector. Also, since most Act 20/22 decree holders move to Puerto Rico with their families, there has been an increase in the enrollment in local private educational institutions and other complementary services.

Other Economic Effects

According to the interviewees, one of the main areas of impact is the commercial and residential real estate sector. Participants mentioned that Act 22 played an important role, particularly in the case of high-end projects in distress, both in completing projects and in selling units. This has been the case, not only with decree holders, but also with private investors who have been attracted to Puerto Rico since the enactment of this Law, even though they are not benefiting from it directly.

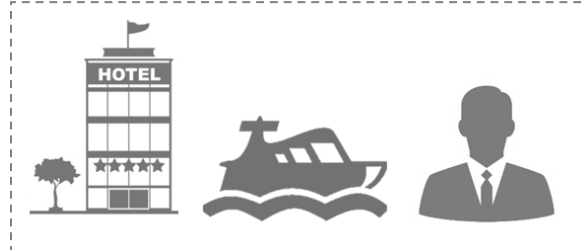
Act 22 investors were initially more interested in renting properties rather than buying. This trend changed since mid-2014, when there was a noticeable increase in real estate sales. Information provided by agents confirmed that most Act 22 grantees who are buying homes in Puerto Rico, are acquiring real estate properties in San Juan (Condado Area), Dorado and Humacao (Palmas del Mar). Similarly, most renters are also located in San Juan's Condado Area and Dorado.

In terms of residential real estate, they are mostly concentrated in Dorado, Humacao, Rio Grande and San Juan. Total investment in residential real estate exceeds \$150 million. The average property value is around \$1.5

million. Furthermore, major investors- who are not decree holders, but which are indirectly incentivized by both programs, were interviewed. An investor reported initial investments of \$76.6 million for the purchase of a residential apartment building, commercial spaces and adjacent lots in San Juan. An additional \$44.7 million in capital expenditures has been invested to finance the construction and renovations of the residential apartment complex and its commercial premises.

Total investment in residential real estate exceeds \$150 million

TOTAL INVESTMENT



The acquisition, remodeling and improvement of hotels, office buildings, marinas, as well as partnerships with local businesses, have generated a total investment of \$125 million as a result of Act 22.

As to commercial properties, the biggest real estate firms in Puerto Rico move around \$40

to \$50 million a year in transactions related to Act 20/22 investors. The acquisition, remodeling and improvement of hotels, office buildings, marinas, as well as partnerships with local businesses, have generated a total investment of \$125 million as a result of Act 22. Informants indicated that, besides acquisition price, most entrepreneurs are planning to make additional investments in the properties acquired within the Island. The development of these commercial properties has also created direct jobs in administration and customer service, as well as construction jobs. Moreover, non-decree holders have also acquired commercial properties for a total approximate investment of \$650 million.

COMMERCIAL PROPERTIES INVESTMENT



Approximate investment of **\$650 million**

Some particular investments include a marina for \$50.2 million and an additional \$10.6 in renovations of the infrastructure. Some key informants have already awarded contracts for further commercial developments within the Island which total over \$112 million for the following three years.

FURTHER COMMERCIAL DEVELOPMENTS



total over **\$112 million** for the following three years.

Related to Act 20, interviewees stated that most participants are foreign companies that established offices in Puerto Rico to export services from the Island. These businesses are mostly engaged in financial, technological and consulting services. According to the informants, their profile has changed since the enactment of the Law in 2012. During 2013, most Act 20 companies were leasing small office spaces; while in 2014-2015 most business in the technological industry, such as programmers, web designers, cloud hosting, web marketing, call centers, with 25 to 50 employees needed larger facilities to carry out their services.

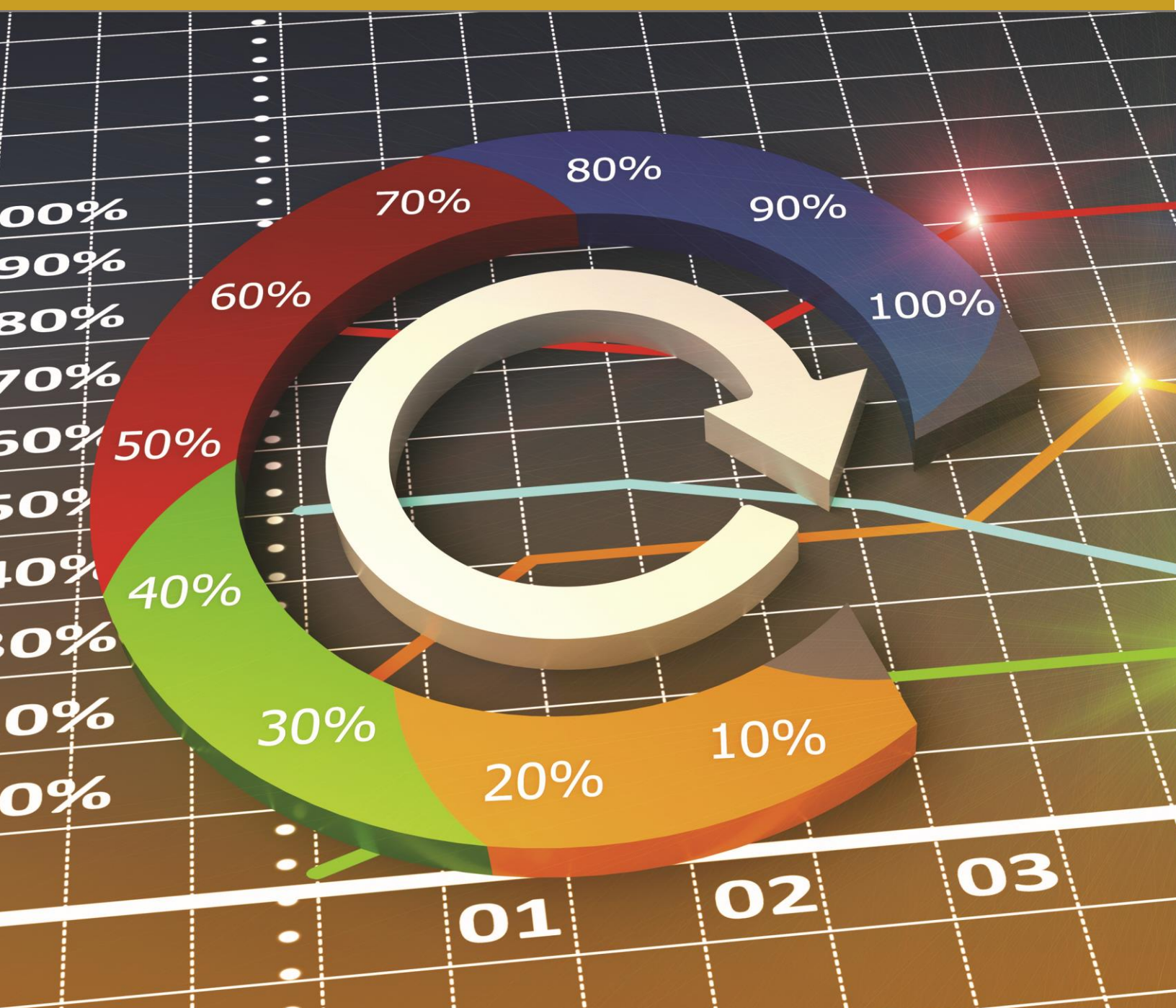
FINANCIAL SERVICES



Act 20/22 decree holders have over 730 bank accounts in local banking institutions and some institutions reported having close to **\$100 million** in deposits from these clients.

In terms of local financial services, Act 20/22 decree holders have over 730 bank accounts in local banking institutions and some institutions reported having close to \$100 million in deposits from these clients. Individual investors have generated over \$85 million in residential mortgages closings and used local banking services for investments of more than \$5 million. Similarly, multiple credit cards have been granted and commercial credit lines of over \$6 million are currently operating. Between 2014 and 2015 all these figures have experienced an average growth of more than 80%.

FORECAST



10 Year Forecast for the Expected Number of Act 20 and Act 22 Decrees

Estimates are based on DDEC's database. Additional qualitative data was gathered for validation, including interviews with key informants. Only official data was used to develop aggregate figures of economic impact.

Limitations

The information provided by the Department of Economic Development comprises four (4) years of decree approvals, which accumulate into 360 approved Act 20 decrees and 574 Act 22 decrees. However, the only "complete year" of available information in annual reports is 2014. Additionally, due to the incipient nature of the project, there is clearly not enough decree data to produce accurate forecasts for long periods based on extensive time series.³³ Finally, the potential results are greatly influenced by the agency resources

In order to estimate the potential long-term impact of Act 20 and Act 22 decrees, the potential trend in decree growth up to 2024 was estimated. This provides a reasonably conservative estimate of expected decree counts, based primarily on the behavior of the potential demand for these decrees and the cumulative effects of promotional activities.

involved in the programs: a significant change in these would heavily influence the outcome of the programs far beyond any statistical trend, and would not be explainable by the economic information of current applicants. Therefore, our forecasts hold a very "ceteris paribus" plausibility with limited statistical power, and should only be deemed as an assessment of plausible scenarios following particular trends.

To simplify the analysis, all future decrees were assumed to be for residents and firms from the main markets which comprised the profile of decree holders.

Theoretical Approach

Our forecasts took the approach of modeling the overall trend in the *potential base of applicants* for each Act, and deriving an estimated number of decrees from the parameters in said model. This potential base was defined as *the group of*

individuals having a shared set of determinant characteristics with the decree holders. Potential decree holders are expected to be "drawn" from this potential base, i.e. every applicant is assumed to come from this particular base (up to a margin of error).

³³ This refers to time series forecasts, which dynamically model the trend in decrees alongside other external factors and could produce a more reliable estimate

of the decree count, particularly for such a long time span.

Proxies of the Potential Base

The potential base is not directly observable, but can be approximated by using a set of proxy variables. These proxies differ with respect to the original definition of potential base as defined above, but do serve as a parsimonious representation of it. Selecting the suitable proxies for each Act consisted of a multi-part process, involving 1) ranking the most important characteristics of the eligibility requirements in each Act, and 2) evaluating the available pools of related variables for which there exists a reasonable amount of data available. After several discussions and a consensus interpretation of the eligibility requirements, the following potential pools were identified:

1) Establishments involved in Act 20 eligible activities

- a. An establishment is defined by the US Census Bureau as “a business or industrial unit at a single physical location that produces or distributes goods or performs services” (US Census Bureau, 2015). The locational distinction is deemed important, as U.S. firms are able to take advantage of Puerto Rico’s Act 20 by locating a particular establishment in the island, not necessarily creating a new firm. Also, only the activities performed by establishments *located in the island* would be eligible for Act 20 benefits.

2) Owners of housing units with high property value

- a. A difficulty in determining the potential base of Act 22 decree holders was the extremely low response rate to the household income variable, which made income (as reported by participants) unviable as a defining characteristic of participants. Additionally, Act 22 decree holders do not need to generate a high-level income in order to partake in the benefits, which are vested upon *capital assets*.
- b. However, a variable which was reported by most decree holders was the property values which they intended to purchase in the island. The average value of primary properties purchased in Puerto Rico by Act 22 decree holders was 1.8 million, and the bracket of owner-occupied housing units containing this value was selected as the proxy. The reasoning was that *the characteristics of owners of high-value real estate in the US roughly mirror the characteristics of Act 22 decree holders, and hence are sufficiently correlated to the potential base to be used as a proxy.*

The next sections detail the data and forecasting methods used to extend the potential base of each Act into a long-term forecast up to 2024.

Forecasts of the Act 20 Potential Base

Description of the Data

The data used are yearly establishment counts from the US Census Bureau's *County Business Patterns* database.³⁴ This database contains information about employment, payroll and number of establishments for an administrative sample of establishments. This yearly establishment count differs from the

Economic Census (also by the US Census Bureau), which is updated every five (5) years and includes an estimate of all establishments/firms in a particular geographical jurisdiction. The establishment data are classified using the *North American Industrial Classification System* (NAICS), with revisions also made every five (5) years.

Imputation of NAICS to Eligible Activities

Eligible activities are not classified by NAICS codes: hence, a suitable NAICS code was imputed in order to relate the establishment counts to each activity. The level of detail was kept up to 3-digit NAICS codes (industry subsectors), due to the following factors:

- 1) Eligible activities were already broad enough to be classified into more than 1

- NAICS sub-sector, and even more if higher levels of detail were used; and
- 2) More detailed subsectors would not be disclosed if they contained a high level of firm concentration, or too low an employment/establishment count.

The following table presents the imputed NAICS codes for Act 20 eligible activities.

Eligible Activity	Imputed NAICS Codes (2012)		
Research and Development	541		
Advertising and Public Relations	541		
Consulting Services	541	523	524
Commercial Arts and Graphic Services	541		
Production of Blueprints, Architecture, Engineering & Project Management	561		
Professional Services	541		
Centralized Management Services	551		
Centers for Electronic Data Processing	518	519	541
Development of Computer Programs	511	541	
Voice and Data Telecommunications	517	519	513 and 514*
Call Centers	561		
Shared Services Center	541		
Storage and Distribution Centers	492	493	
Educational and Training Services	611		
Hospital and Laboratory Services	621	622	
Investment Banking and Other Financial Services	523	524	

Source: Law 20 of January 17 of 2012, Article 3. Codes selected by Estudios Técnicos, Inc. *These are the equivalent codes for these activities under the NAICS 1997 classification.

³⁴ An establishment is defined by the US Census Bureau as "a business or industrial unit at a single physical location that produces or distributes goods or performs services." See

https://www.census.gov/glossary/#term_Establishment

Timespan of the Data

The sample time period used was 2000-2013, the latest year for which *County Business Patterns* data was available. The NAICS underwent several major revisions from 1997 through 2002, including the broadening of the Telecommunications sub-sectors and the introduction of several new classifications for

older sectors. Hence, only three (3) years of NAICS 1997 data were included, which coincided with the turn of the century and the dot-com explosion – a major structural rift in the history of service exports. For these years, the NAICS 1997 codes which most closely coincided with the NAICS 2002 sectors (which already include the aforementioned changes) were used.

Forecasting Method

The technique involved forecasting the growth trend in the potential base using an Auto-Regressive model of lag 1 (known as an AR-1 process). This model was chosen following the approach given by Box and

Jenkins (1970). The growth in number of establishments was projected for the 2014-2024 period – an 11 year span – due to the fact that the available information exists only up to 2013. The following table presents the estimates and margins of error for the model.

Year	Number of Establishments	Base Case Estimates		
		Base Growth	Margin of Error	Change
2000	1,954,123			
2001	1,987,145	1.69%	1.69%	33,580
2002	2,037,232	2.52%	2.52%	51,349
2003	2,058,809	1.06%	1.06%	21,806
2004	2,105,848	2.28%	2.28%	48,114
2005	2,149,599	2.08%	2.08%	44,660
2006	2,197,208	2.21%	2.21%	48,663
2007	2,249,030	2.36%	2.36%	53,044
2008	2,250,477	0.06%	0.06%	1,448
2009	2,237,191	-0.59%	-0.59%	-13,208
2010	2,247,083	0.44%	0.44%	9,936
2011	2,245,631	-0.06%	-0.06%	-1,451
2012	2,278,944	1.48%	1.48%	33,807
2013	2,298,852	0.87%	0.87%	20,082
2014	2,324,096	1.10%	+/-1.475%	25,244
2015	2,351,839	1.19%	+/-1.603%	27,743
2016	2,380,871	1.23%	+/-1.625%	29,031
2017	2,410,672	1.25%	+/-1.629%	29,802
2018	2,441,025	1.26%	+/-1.630%	30,353
2019	2,471,836	1.26%	+/-1.630%	30,811
2020	2,503,069	1.26%	+/-1.630%	31,233
2021	2,534,712	1.26%	+/-1.630%	31,642
2022	2,566,760	1.26%	+/-1.630%	32,048
2023	2,599,216	1.26%	+/-1.630%	32,456
2024	2,632,083	1.26%	+/-1.630%	32,868

Sources: US Census Bureau (2015), *County Business Patterns* -- 2000 to 2013. Forecasts by Estudios Técnicos, Inc. (2015). Margins of error are based upon a 90% prediction interval.

This model did not consider exogenous factors which may affect the growth in number of establishments; it merely reflects the growth trend in the potential base. As can be seen, the margin of error actually exceeds the forecasted growth in the base case, owing to 1) the small amount of

periodicity in the data (13 growth values) and 2) the large forecasting horizon, which basically doubles the size of the available data. However, this is a normal occurrence in models with such large time horizons (e.g. Hogarth & Makridakis, 1981).

Forecasts of the Act 22 Potential Base

Description of the Data

The data used are the counts of owner-occupied housing units in the U.S. valued above \$1 million, according to the *American Community Survey 1-year Estimates*. Note that our deduplication method for decrees in the real-estate value made possible the correspondence of 1 homeowner to exactly 1 primary residence, since the Act 22 spouses'

duplicated data was discounted in estimating the property value. Likewise, the value of owner-occupied housing units had a 1-1 correspondence with the primary residence, due to the occupation requirement of the estimated universe. Hence, the number of housing units (which is the variable provided by the Census data) can also be taken as the number of eligible homeowners (family or otherwise).

Timespan of the Data

The sample time period was 2005-2014, the latest year for which the *American*

Community Survey 1-Year Estimates were available.

Forecasting Method

As with the Act 20 forecasting, the technique utilized followed the approach by Box and Jenkins (1973). Using the lag specification, an AR-1 model was also utilized to model the growth rate of new housing units. The forecasting period was 2015-2014 – a 10 year timespan. Mirroring the Act 20 forecast methodology, no exogenous factors were considered in the model, giving a trend-estimate of the growth in housing-units.

As can be seen in the following table, the number of data values available is of less size

as the forecasting period (9 growth values vs 10 forecasted values). As a result, the mean predictions take their own forecasted values as exact in the calculation of the longer-term forecasts, without taking any actual data to weigh these estimates. This compounds the margin of error by the inherent uncertainty in taking the point estimate as given (see Sorjamaa, Hao, Reyhani, Ji & Lendasse, 2007). Note that this compounding is independent of the type of model used, since it comes as a result of the proxy characteristics.

Actual and Forecasted Number of Owner-Occupied Housing Units With Property Value Above \$1 million

Year	Owner-Occupied Housing Units Valued Above \$1 Million	Base Case Estimates		
		Base Growth	Margin of Error	Change
2005	1,488,414			
2006	1,826,113	22.7%		
2007	1,974,385	8.1%		
2008	2,024,287	2.5%		
2009	1,676,630	-17.2%		
2010	1,558,461	-7.0%		
2011	1,472,701	-5.5%		
2012	1,460,472	-0.8%		
2013	1,558,025	6.7%		
2014	1,770,990	13.7%		
2015	1,967,569	11.1%	+/-15.431%	196,579
2016	2,154,329	9.5%	+/-18.205%	186,760
2017	2,337,132	8.5%	+/-19.182%	182,803
2018	2,520,722	7.9%	+/-19.552%	183,590
2019	2,708,793	7.5%	+/-19.695%	188,070
2020	2,904,208	7.2%	+/-19.751%	195,415
2021	3,109,233	7.1%	+/-19.773%	205,025
2022	3,325,725	7.0%	+/-19.781%	216,492
2023	3,555,278	6.9%	+/-19.784%	229,553
2024	3,799,328	6.9%	+/-19.786%	244,050

Sources: American Community Survey 1-Year Estimates (2015). Value [Table B25075]. Forecasts by Estudios Técnicos, Inc. (2015). Margins of error based upon a 90% prediction interval.

Obtaining Decree Estimates: The Static and Dynamic Capture Rates

After the potential base was forecasted, a formula for deriving the decree estimates was used. This formula made use of an assumption which requires the introduction of two (2) important terms:

- 1) The *static capture rate* (SCR) – also known as simply the *capture rate*, it is defined as the ratio of decrees to the potential base for a particular time period. An increase in the capture rate

implies that the decrees represent a *larger* proportion of their potential base.

- 2) The *dynamic capture rate* (DCR) – it is defined as the change in decrees, as a percentage of the *change* in the potential base. It is a measurement of the velocity at which decrees increase with respect to the potential base. Changes in the DCR correspond to the *acceleration* in the capture rate, or variations in the speed at which new decrees increase.

The primary assumption used was that the DCR remains constant throughout the period, that is, decrees will be added at a constant rate from 2016 onwards. Although highly restrictive, the aforementioned implication is consistent with the idea that our forecasts model the exogenous demand trends only. *At any given time, the set of factors endogenous to the agency may significantly alter the velocity at which decrees are*

added, and thus violate the assumptions used in this forecast.

The formula used to derive the number of decrees for each formula is $D_{t+1} = k(B_{t+1} - B_t) + D_t$, where k is a constant, B_t is the potential base at time t , and D_t is the number of decrees at time t . The parameter of interest is k , which was determined using the methods described below.

Scenarios for the Dynamic Capture Rate

Due to the lack of data in order to estimate k , a scenario approach was used instead.

We evaluated the empirical estimates of the DCR by year, which are presented in the tables below.

Estimation of the Dynamic Capture Rate for Act 20

Year	Change in Establishments	Change in Act 20 Decrees*	Dynamic Capture Rate (DCR) for Act 20
2012	33,807	35	0.1028%
2013	20,082	50	0.2477%
2014	25,522	124	0.4902%
2015**	28,074	295	1.0624%

Sources: Data provided by the PR Department of Economic Development for Act 20 decree holders. US Census Bureau (2015). *County Business Patterns – 2012 and 2013*. Forecasts by Estudios Técnicos, Inc. (2015). *There were 11 decrees whose date of approval was not included, which were split evenly between the four (4) years and added to the number of decree holders for each year. **2015 includes both the amount of decree holders as of February 2, 2015, and the number of non-canceled decree applications for 2015. This is due to the fact that the PR Department of Economic Development is currently accepting all applications as eligible decree holders.

Estimation of the Dynamic Capture Rate for Act 22

Year	Change in Home Owners	Change in Act 22 Decrees*	Dynamic Capture Rate (DCR) for Act 22
2012	-12,229	18	-0.1492%
2013	97,553	120	0.1233%
2014	212,965	262	0.1231%
2015**	196,579	318	0.1619%

Sources: Data provided by the PR Department of Economic Development for Act 20 decree holders. US Census Bureau (2015). *County Business Patterns – 2012 and 2013*. Forecasts by Estudios Técnicos, Inc. (2015). *There was 1 decree whose date of approval was not included in the data supplied, which was split evenly between the four (4) years and added to the number of decree holders for each year. **2015 includes both the amount of decree holders as of February 2, 2015, and the number of non-canceled decree applications for 2015. This is due to the fact that the PR Department of Economic Development is currently accepting all applications as eligible decree holders.

Using these estimates, the following scenarios were constructed for each Act:

- 1) **Base Scenario** – the DCR for the forecast period is the average of the DCR in the two (2) most recent years.
- 2) **Optimistic Scenario** – the DCR is the greater of the two (2) most recent years.

- 3) **Pessimistic Scenario** – the DCR is the lesser of the two (2) most recent years.

Due to the short time span since the Acts' approval, only the two (2) most recent years were used to construct each scenario. These years are more likely to reflect a realistic DCR as the decree programs have more maturity.

Results

The following tables present the forecasts from 2015 to 2024, according to each of the scenarios discussed.

Expected Trend in Act 22 Decrees, by Scenario

Year	Baseline (Average 2014-2015 DCR)	Optimistic (Best-Performing DCR)	Pessimistic (Worst-Performing DCR)
2015	719	719	719
2016	985	1,021	949
2017	1,246	1,317	1,174
2018	1,507	1,615	1,400
2019	1,775	1,919	1,632
2020	2,054	2,235	1,872
2021	2,346	2,567	2,125
2022	2,655	2,918	2,391
2023	2,982	3,289	2,674
2024	3,330	3,685	2,975

Sources: Data provided by the PR Department of Economic Development (2015). Forecasts by Estudios Técnicos, Inc. (2015). DCR = Dynamic Capture Rate – See Section __ for explanation.

Expected Trend in Act 20 Decrees, by Scenario

Year	Baseline (Average DCR)	Optimistic (Best-Performing DCR)	Pessimistic (Worst-Performing DCR)
2015	503	503	503
2016	728	811	645
2017	960	1,128	791
2018	1,195	1,451	940
2019	1,435	1,778	1,091
2020	1,677	2,110	1,244
2021	1,923	2,446	1,399
2022	2,171	2,786	1,557
2023	2,423	3,131	1,716
2024	2,679	3,480	1,877

Sources: Data provided by the PR Department of Economic Development (2015). Forecasts by Estudios Técnicos, Inc. (2015). DCR = Dynamic Capture Rate – See Section __ for explanation.

10 Year Forecast of the Economic Impact of Act 20 and Act 22

Obtaining the impact for Law 20 and 22 firms involved two (2) general steps: 1) measuring

the individual footprint of each decree, and 2) establishing an appropriate dynamic for the behavior of each new entrant across time. The total impact is the aggregation of the decrees' dynamic footprint across the estimated time span.

General Assumptions

The following assumptions were held as true in both Act 20 and Act 22 forecasts:

- 1) As with the decree forecast, each new decree is assumed to be "captured" from a potential base of applicants, which is approximated via proxies.
- 2) The distribution of decrees by sector is dynamic, and will change over time according to the industrial/individual characteristics of each new entrant. Therefore, it cannot be held fixed across time.
- 3) Each new entrant behaves according to the general trend of the currently

approved decrees with respect to employment and revenues. In other words, *outliers were not considered in any of the footprint estimates.*

The last assumption is important, since in more than one of the measured variables, a small set of outlying decrees represented a disproportionate amount of the total impact. We hold these values as probabilistically indistinguishable from 0, in that the base probability of new entrants with these characteristics, compounded over the considered time period, is basically 0.

Step 1: Measuring the Individual Footprint

The Trimmed Mean

The *trimmed mean* served as the primary estimate for the footprint of evaluated variables. A *trimmed mean* Σ with trim factor $\phi \in [0,50]$ is an average which excludes the top ϕ percent of the highest-valued half of the data, and the bottom ϕ percent of the lowest-valued half of the data. The trimmed mean serves to remove outliers from the estimates, thus providing a more robust

estimate when compared with the regular mean. With the exception of non-eligible employment, all trimmed means used a trim factor of 5%. Due to the small sample size in non-eligible employment, the trimmed mean for this variable used a trim factor of 2.5%.

The following tables present the estimated decree footprint for each of the considered variables, using the data from the hybrid-approach datasets discussed in previous estimates.

Estimates of the Act 20 Tax Decree Footprint

Trimmed Means

Employment by Decree	
Eligible Activities	2.7
Non-eligible Activities*	0.6
Average Wages Paid per Employee	
Eligible Activities	\$39,735
Non-eligible Activities	\$56,578
Gross Income by Decree	
Eligible Activities	\$1,925,337
Non-eligible Activities	\$225,865
Corporate Income Tax Paid by Decree	
Eligible Activities	\$39,785
Non-eligible Activities	\$5,687

Sources: Data provided by the PR Department of Economic Development (2015). Estimates by Estudios Técnicos, Inc. (2015). All estimates in this table are trimmed means. *The trim factor is 5% for all variables, excluding employment in non-eligible activities, which has a trim factor of 2.5%.

Estimates of the Act 22 Tax Decree Footprint

Trimmed Means

Money Spent in Puerto Rico (Excluding Rent and Mortgage)	\$101,802
Employment	1.8
Property Value	\$1,022,733
Rent Payment (12-Year Value)	\$33,347

Sources: Data provided by the PR Department of Economic Development (2015). Estimates by Estudios Técnicos, Inc. (2015). Trimmed means were used for all variables in this table, with a trim factor of 5%.

Step 2: Establishing Behavioral Dynamics

While the forecasting process involved only characteristics of the potential pools and obtaining an estimated number of decrees, the impact measurement involves additional assumptions regarding the long-term behavior of each decree. Due to the heterogeneity in the types of decrees, these were evaluated in a multi-generation approach which is detailed in the following subsections.

Act 20

Each year, a specified number of entrants is added to the already active decrees. We refer to this number as a *generation* of decrees. All generations follow a specified 10-year behavior regarding their economic

footprint; however, they begin said pattern at different starting years, and thus each generation contributes a different amount per year. The specified behavior is as follows:

- 1) Introduce the establishment with α_1 employees, and hire β_1 employees for three (3) more years (not necessarily in sequence);
- 2) Generate α_2 in yearly gross income;
- 3) Produce α_3 in payroll per year; and
- 4) Pay α_4 percent of the gross income in corporate income taxes.

This pattern was generated for both eligible and non-eligible activities, with each type of activity differing in its starting values. As no assumption regarding the distribution of

decrees was made for each year, each generation originally had the same starting parameters for its corresponding eligible and non-eligible activities. To address this, three (3) sources of exogenous variation were introduced:

- 1) The starting value for each decree's yearly revenue was updated according to growth in the US real GDP for the imputed NAICS sectors of the potential base.
 - a. A 10-year trend forecast of real GDP growth in the US was made using ARIMA models. The resulting forecasted growths were then applied to the base revenue footprint of each decree during its respective entrance year.
 - b. The data used for the forecast was the *Value Added by Industry* table from the Bureau of Economic Analysis, from 1997 to 2014. Some sectors were excluded from the estimate, as these tables did not hold the required levels of NAICS detail to include all categories, even at the general levels used for the imputation.
- 2) The average wage paid in eligible activities was updated each year according to Puerto Rico's wage growth in the imputed NAICS sectors, assuming that the decree holders will maintain the PR wage scale when hiring workers.
 - a. A 10-year trend forecast of quarterly wage growth and employment in

eligible activities was made using ARIMA models, and the resulting growth in the average wage was applied to the base wage.

- b. The data was retrieved from the *Quarterly Census of Employment and Wages*, a quarterly dataset compiled by the Bureau of Labor Statistics, from January 2001 to June 2015. Non-disclosed values at differing levels of detail in NAICS sectors were imputed using the either last known disclosed value for each series, or the value such that the annual averages coincide with the reported statistic, if said averages were available.
- 3) The average wage paid in non-eligible activities was updated yearly according to Puerto Rico's overall growth in quarterly wages.
 - a. The same treatment as with the previous series was given to this forecast. The data used was obtained from the same source as the forecast for eligible activities.

The following tables present the forecasted growths for GDP and average wages in eligible and non-eligible activities. As can be seen, the margin of error is very wide for the average wage forecasts, due to compounded uncertainty for both wage and employment growths. This is particularly the case in eligible activities due to the additional imputation procedures which had to be made for non-disclosed data.

Forecasts & Actual Values of Real GDP Growth in the Potential Base of Eligible Activities (United States)

Year	Estimate (in billions)	Margin of Error	Growth
1997	\$2,695		
1998	\$2,830		5.0%
1999	\$2,963		4.7%
2000	\$3,087		4.2%
2001	\$3,241		5.0%
2002	\$3,313		2.2%
2003	\$3,405		2.8%
2004	\$3,553		4.3%
2005	\$3,723		4.8%
2006	\$3,855		3.5%
2007	\$3,913		1.5%
2008	\$3,943		0.8%
2009	\$3,780		-4.1%
2010	\$3,886		2.8%
2011	\$3,980		2.4%
2012	\$4,112		3.3%
2013	\$4,177		1.6%
2014	\$4,331		3.7%
2015	\$4,469	+/-148	3.2%
2016	\$4,604	+/-161	3.0%
2017	\$4,741	+/-167	3.0%
2018	\$4,881	+/-172	2.95%
2019	\$5,025	+/-177	2.95%
2020	\$5,173	+/-183	2.94%
2021	\$5,325	+/-188	2.94%
2022	\$5,482	+/-194	2.94%
2023	\$5,643	+/-199	2.94%
2024	\$5,809	+/-205	2.94%

Sources: US Bureau of Economic Analysis (2015). *GDP by Industry - Value Added - 1997 to 2014*. Forecasts by Estudios Técnicos, Inc. (2015). Note: Some sectors were not included in the forecasts, due to there not being enough detail in the GDP tables used to be included.

**Forecasts & Actual Values of Real GDP Growth in the
Potential Base of Non-eligible Activities (United States)**

Year	Estimate (in billions)	Margin of Error	Growth
1997	\$11,035		
1998	\$11,526		4.4%
1999	\$12,066		4.7%
2000	\$12,560		4.1%
2001	\$12,682		1.0%
2002	\$12,909		1.8%
2003	\$13,271		2.8%
2004	\$13,773		3.8%
2005	\$14,234		3.3%
2006	\$14,614		2.7%
2007	\$14,874		1.8%
2008	\$14,830		-0.3%
2009	\$14,419		-2.8%
2010	\$14,784		2.5%
2011	\$15,021		1.6%
2012	\$15,355		2.2%
2013	\$15,583		1.5%
2014	\$15,962		2.4%
2015	\$16,355	+/-459	2.5%
2016	\$16,753	+/-527	2.4%
2017	\$17,158	+/-555	2.4%
2018	\$17,572	+/-572	2.41%
2019	\$17,995	+/-586	2.41%
2020	\$18,428	+/-601	2.41%
2021	\$18,871	+/-615	2.40%
2022	\$19,324	+/-630	2.40%
2023	\$19,789	+/-645	2.40%
2024	\$20,264	+/-661	2.40%

Sources: US Bureau of Economic Analysis (2015). *GDP by Industry - Value Added - 1997 to 2014*. Forecasts by Estudios Técnicos, Inc. (2015).

**Forecasts & Actual Values of Average Wage in the
Potential Base of Act 20 Eligible Activities (Puerto Rico)**

Year	Base Value	Margin of Error	Growth
2001	\$21,478		
2002	\$21,990		2.4%
2003	\$22,289		1.4%
2004	\$23,078		3.5%
2005	\$23,895		3.5%
2006	\$24,849		4.0%
2007	\$25,729		3.5%
2008	\$27,168		5.6%
2009	\$27,622		1.7%
2010	\$28,275		2.4%
2011	\$28,595		1.1%
2012	\$28,852		0.9%
2013	\$28,951		0.3%
2014	\$29,629		2.3%
<hr/>			
2015*	\$30,396	+/-118,545	2.6%
2016	\$30,667	+/-154,499	0.89%
2017	\$30,936	+/-198,838	0.88%
2018	\$31,207	+/-234,149	0.88%
2019	\$31,480	+/-263,242	0.88%
2020	\$31,755	+/-288,153	0.87%
2021	\$32,033	+/-309,997	0.87%
2022	\$32,312	+/-329,472	0.87%
2023	\$32,594	+/-347,051	0.87%
2024	\$32,879	+/-363,073	0.87%

Sources: US Bureau of Labor Statistics (2015). *Quarterly Census of Employment and Wages*. Note: Wage and Employment data was imputed for some sectors, due to differing periods of data collection and/or nondisclosure at certain levels of detail. The imputation procedure was to use a fixed value which balanced the annual averages with the monthly available data, or the last current value if no other available data was needed. *The last two (2) quarters of 2015 were forecasted.

Forecasts & Actual Values of Average Wage in the Potential Base of Act 20 Non-eligible Activities (Puerto Rico)

Year	Base Value	Margin of Error	Growth
2001	\$19,162		
2002	\$19,842		3.5%
2003	\$20,318		2.4%
2004	\$20,871		2.7%
2005	\$21,523		3.1%
2006	\$22,215		3.2%
2007	\$23,145		4.2%
2008	\$24,055		3.9%
2009	\$24,516		1.9%
2010	\$24,813		1.2%
2011	\$25,036		0.9%
2012	\$25,195		0.6%
2013	\$25,284		0.4%
2014	\$25,593		1.2%
2015*	\$26,156	+/-83,321	2.2%
2016	\$26,376	+/-81,463	0.84%
2017	\$26,630	+/-81,714	0.96%
2018	\$26,919	+/-83,612	1.08%
2019	\$27,242	+/-86,396	1.20%
2020	\$27,603	+/-89,850	1.32%
2021	\$28,001	+/-93,878	1.44%
2022	\$28,438	+/-98,430	1.56%
2023	\$28,916	+/-103,478	1.68%
2024	\$29,437	+/-109,005	1.80%

Sources: US Bureau of Labor Statistics (2015). *Quarterly Census of Employment and Wages*. Forecasts by Estudios Técnicos, Inc. (2015). *The last two (2) quarters of 2015 were forecasted.

The increment in average size by year for the three periods was determined by calculating the trimmed mean of employment by decree for each proposed year, and using it as an estimate of the growth in employment

Trimmed Mean of Proposed Full-Time Employees per Act 20 Decree - Eligible Activities

Year of Proposal	Employment by Decree	Growth
Entrance	2.0	
First Year	3.9	93.5%
Second Year	4.8	23.6%
Third Year	5.4	13.2%

Source: Data provided by the PR Department of Economic Development. All estimates of employment were trimmed means, with trim factor of 5%.

size per decree holder during the hiring stage of each generation. The following table presents these calculations. Note that 126 Act 20 decrees did not specify a date of commencement.

Trimmed Mean of Proposed Full-Time Employees per Act 20 Decree - Non-eligible Activities

Year of Proposal	Employment by Decree	Growth
Entrance	1.3	
First Year	1.2	-6.6%
Second Year	1.3	7.7%
Third Year	1.6	25.5%

Source: Data provided by the PR Department of Economic Development. All estimates of employment were trimmed means, with trim factor of 2.5%.

Continuing Impact of Existing Decree Holders

Existing decree holders were also incorporated in the projection, since they also contributed to the economic impact for the forecast period. We assumed that these decrees were previous generations of decrees, which were at a particular stage in their employment, gross income, tax and payroll growth. Therefore, *the starting values used for existing Act 20 decree holders were the corresponding average values for their particular economic stage.*

To impute their employment contribution, they were first classified by year of approval, and assumed to follow a 3-year hiring window with the previous characteristics. Decrees approved in 2012 were assumed to be in their final hiring stage, decrees approved in 2013 were in their second hiring year, and so on. Calculated impacts which fell into the specified time period were also incorporated to the projections.

Act 22

The following assumptions about future decree holders were made in order to produce the estimates:

- 1) Each decree holder made only one (1) purchase of a primary residence during the 10-year period;
- 2) In the case of renters, each decree holder maintained the acquired rent contract from his/her entrance year to the end of the estimated timespan;
- 3) The hiring stage of each decree holder was reduced from three (3) years to two (2), as there is no employment requirement for approval, in contrast to the Act 20 decree holders;
- 4) For the same reason, the employment estimates were weighed by the proportion of Act 22 decrees expected to generate employment, contrary to the

Act 20 methodology where this proportion was assumed to be 100%; and

- 5) Each decree holder is assumed to spend the reported footprint of money spent in Puerto Rico from his/her entrance year to the end of the period.

Estimates of purchased real estate were calculated by multiplying the estimated real estate footprint by the number of entrants each year. Rent estimates were calculated by accumulating the yearly rent value of each generation from the date of entrance to the end of the ten-year period. The same methodology was used for the estimate of money spent in Puerto Rico. Finally, the employment created was estimated following the approach of the Law 20 forecasts. The average growth in the employment footprint was approximated by calculating the growth in average employment per decree, distributed by the effective date of the decree (for income purposes).

**Trimmed Mean of Employment per Decree, by
Effective Date for Income Purposes**

Year	Employment by Decree	Growth
2012	2.1	
2013	0.9	-58.5%
2014	3.1	250.5%
2015	1.9	-37.5%

Source: Data provided by the PR Department of Economic Development (2015). All estimates of employment by decree were trimmed means, with a trim factor of 2.5%.

Continuing Impact of Existing Decree Holders

As with Act 20, the existing Act 22 decree holders were assumed to exert a continuing impact throughout the 2015-2024 period,

and thus were incorporated into the overall impact. The methodology mirrors that for Act 20.

Results

Act 20

The following tables show the results under the base scenario of Act 20 decrees added by year. Over the 10-year period from 2015 to 2024, a total of 2,351 additional decrees are expected to be added. These are expected to generate an average of 4,237 employees per year, or a total of 44,656 new employees. Of this total, 38,073 employees would be in

eligible activities, and 6,583 would be in non-eligible activities.

The gross income generated by these decree holders would amount to an additional \$3,810.5 million per year, for a total of \$38,510 million of new corporate income added over the 10-year period. The accumulated corporate income tax paid throughout the period would amount to \$808.9 million.

Projected Impact of Law 20 Decrees -- 2015 to 2019

Concept	2014 (Actual)	2015	2016	2017	2018	2019	5-Year Accumulated Impact (2015-2019)
Employment Generated by Year	1,769	2,282	3,612	4,918	5,844	5,280	21,936
Eligible Activities	1,277	1,802	2,793	4,061	5,058	4,572	18,286
Non-Eligible Activities	492	480	820	857	785	708	3,650
Gross Income Generated by Year (in millions)	\$896.0	\$1,133.9	\$1,710.2	\$2,320.9	\$2,962.3	\$3,634.9	\$11,762.2
Eligible Activities	\$824.6	\$968.4	\$1,431.7	\$1,919.9	\$2,430.7	\$2,963.4	\$9,714.2
Non-Eligible Activities	\$71.4	\$165.5	\$278.5	\$400.9	\$531.6	\$671.5	\$2,048.0
Corporate Income Tax Paid by Year (in millions)	\$26.6	\$24.2	\$36.6	\$49.8	\$63.6	\$78.1	\$252.3
Eligible Activities	\$24.7	\$20.0	\$29.6	\$39.7	\$50.2	\$61.2	\$200.7
Non-Eligible Activities	\$2.0	\$4.2	\$7.0	\$10.1	\$13.4	\$16.9	\$51.6
Payroll Generated by Year (in millions)	\$78.5	\$106.4	\$162.8	\$241.8	\$335.4	\$360.2	\$1,206.6
Eligible Activities	\$50.7	\$87.7	\$134.4	\$202.7	\$284.8	\$306.0	\$1,015.5
Non-Eligible Activities	\$27.8	\$18.7	\$28.4	\$39.1	\$50.7	\$54.2	\$191.1

Sources: Data provided by the PR Department of Economic Development (2015). Estimates by Estudios Técnicos, Inc. (2015). *Is the number of applications in progress for this year, which are assumed will obtain a decree.

Projected Impact of Law 20 Decrees -- 2020 to 2024

Concept	2020	2021	2022	2023	2024	Accumulated Impact (2020-2024)	Grand Total (2015-2024)
Employment Generated by Year	1,525	4,726	5,335	5,495	5,639	22,720	44,656
Eligible Activities	1,267	4,118	4,665	4,805	4,932	19,787	38,073
Non-Eligible Activities	258	608	670	690	708	2,933	6,583
Gross Income Generated by Year (in millions)	\$3,932.4	\$4,574.7	\$5,242.5	\$5,936.5	\$6,657.4	\$26,343.3	\$38,105.5
Eligible Activities	\$3,525.7	\$4,102.7	\$4,702.9	\$5,327.0	\$5,975.6	\$23,634.0	\$33,348.2
Non-Eligible Activities	\$406.7	\$472.0	\$539.5	\$609.4	\$681.7	\$2,709.3	\$4,757.3
Corporate Income Tax Paid by Year	\$83.1	\$96.7	\$110.8	\$125.4	\$140.6	\$556.6	\$808.9
Eligible Activities	\$72.9	\$84.8	\$97.2	\$110.1	\$123.5	\$488.4	\$689.1
Non-Eligible Activities	\$10.2	\$11.9	\$13.6	\$15.3	\$17.2	\$68.2	\$119.8
Payroll Generated by Year (in millions)	\$368.1	\$375.4	\$382.5	\$389.5	\$396.8	\$1,912.3	\$3,118.9
Eligible Activities	\$312.5	\$318.3	\$323.9	\$329.4	\$335.0	\$1,619.1	\$2,634.6
Non-Eligible Activities	\$55.7	\$57.1	\$58.6	\$60.1	\$61.8	\$293.2	\$484.3

Sources: Data provided by the PR Department of Economic Development (2015). Forecasts by Estudios Técnicos, Inc. (2015).

Act 22

The following tables present the economic impact of Act 22 Decrees. Act 22 Decrees are expected to produce an average of 1,195 jobs per year, for a total of 11,945 jobs

added over the 2015-2024 period. The value of real estate purchased by Act 22 decree holders could be of up to \$1.7 billion, depending on the available inventory. Their 1-year value of rent payments could ascend to \$832.7 million as well.

Forecasted Impact of Law 22

Concept	2015*	2016	2017	2018	2019	Accumulated Impact (2015-2019)
Employment Generated by Year	964	1,341	1,481	1,083	1,079	5,948
Value of Real Estate Purchased by Year (in millions)	\$319.6	\$139.8	\$136.8	\$137.4	\$140.8	\$874.4
1-Year Value of Rent Paid, by Year (in millions)	\$14.0	\$18.3	\$22.6	\$26.8	\$31.2	\$112.9
Money Spent in Puerto Rico, by Year (in millions)	\$63.1	\$67.5	\$71.7	\$75.9	\$80.3	\$358.5

Sources: Data provided by the PR Department of Economic Development (2015). Forecasts by Estudios Técnicos, Inc. (2015). *Corresponds to the number of applications in progress, which are assumed will obtain a decree.

Forecasted Impact of Law 22

Concept	2020	2021	2022	2023	2024	Accumulated Impact (2020-2024)	Grand Total (2015-2024)
Employment Generated by Year	1,098	1,135	1,188	1,251	1,325	5,997	11,945
Value of Real Estate Purchased by Year (in millions)	\$146.3	\$153.5	\$162.0	\$171.8	\$182.7	\$816.3	\$1,690.6
1-Year Value of Rent Paid, by Year (in millions)	\$35.7	\$40.4	\$45.4	\$50.7	\$56.4	\$228.6	\$341.5
Money Spent in Puerto Rico, by Year (in millions)	\$84.8	\$89.5	\$94.5	\$99.9	\$105.5	\$474.2	\$832.7

Sources: Data provided by the PR Department of Economic Development (2015). Forecasts by Estudios Técnicos, Inc. (2015). *Corresponds to the number of applications in progress, which are assumed will obtain a decree.

Conclusions

Act 20 companies are mainly exporting to the USA but are also engaging in business relationships with countries around the world. This has potential spillover effects in Puerto Rico's local economy, particularly in providing know-how of international markets, so that other local services providers could move beyond internal demand.

In the long-run, maintaining both policy tools could render strong yields for the local economy, particularly if the local government and service providers are able to capture the spillover effects of these grantees. Moreover, having incentives to develop the service sector will enable Puerto

Rico to absorb the economic activity generated by more robust service sectors. In contrast with the previous development strategy, which focused on manufacturing, incentivizing the service sector -even through the injection of foreign capital- will bring about stronger economic growth. That is, the entry barriers to the service economy are much lower than that of manufacturing and technology transfer is almost a natural condition of the knowledge economy.

Given the short period of time since enactment, one should expect the biggest returns once a healthy critical mass has been reached.

Recommendations

In terms of policy, the DDEC should consider establishing thresholds related to employment and investment requirements and for Act 20 and Act 22. This will contribute to the achievement of the Department's objective in terms of economic impact.

Promotional efforts should also focus on incentivizing local firms to obtain these types of decrees. Due to the many structural inefficiencies in the island, the benefits of tax alleviation to local firms are bound to be greater in comparison to foreign firms. The low entry requirement should be maintained for local firms, in order to increase the incentives effectiveness.

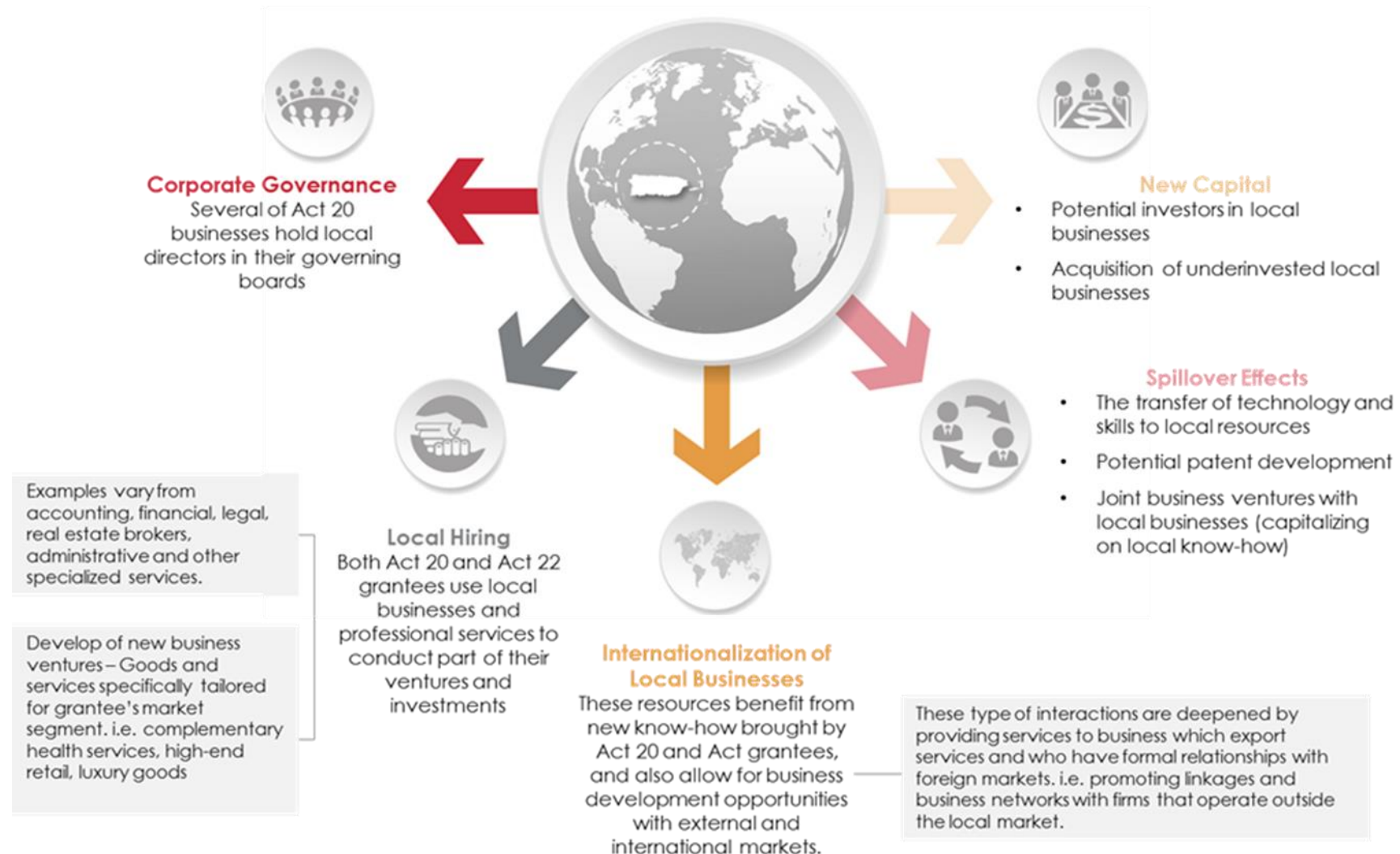
These laws, specifically Law 20, should be seen as part of a broader framework of developing local start-ups in these eligible activities. A grant program for incubating/accelerating local Act 20 firms could be considered, in order to promote a larger local base of these types of firms.

For Act 22 decree holders, an investment requirement in conformity with the development of Act 20 firms or other types of enterprises should be included. The objective of Act 22 should be to incentivize the arrival of foreign entrepreneurs towards Act 20 eligible activities or some other type of investment; this objective must be enforced by appropriate requirements which promote investment and growth in the local economy.

APPENDIX



Internal Linkages of Act 20 and Act 22



ECOSISTEMA DE UNA NUEVA ECONOMÍA DE SERVICIO Y CONOCIMIENTO

Encadenamiento logrado por la transformación a una economía de exportación de servicios utilizando como base las Leyes 20, 22, 27, 273, 399 y 73, con la visión de un Puerto Rico globalizado donde las leyes actúan y se promueven en conjunto.



Esta información es para propósitos ilustrativos exclusivamente y no es una lista taxativa de los proveedores de servicios y compañías en cada una de las categorías.

This information is for illustration purposes only. Actual number of participants may vary. Source: DDEC.

DDEC Management Forecasts and Estimates

The purpose of forecasting is to make predictions, or inferences regarding future characteristics given a representation of reality in a fixed state. There exist various types of forecasting techniques, with a wide variation in sophistication. This section compares the approach used by Estudios Técnicos, Inc. (ETI) with an extrapolation approach by the PR Department of Economic Development (DDEC, by its Spanish acronym), based upon certain assumptions regarding decree holders.

There is no single “correct” approach to a forecasting, and the actual accuracy of a forecast can only be determined by the empirical forecast error. As neither method used statistical approaches to directly estimate the economic impact, estimates of forecast error do not exist. Hence, only the reasonability of the estimates can be evaluated, based upon the current historical experience.

The DDEC Approach

The DDEC used a series of internal assumptions with respect to the growth rate in upcoming years up to 2022. These assumptions were then applied to the historical trend in decrees, to derive the economic impact estimates. The following assumptions were used:

Act 20 Assumptions

- 1) From 2016 through 2018, the number of approved Act 20 decrees is expected to double; from 2019 to 2022, it is expected to grow by 10% each year.
- 2) Each new Act 20 decree holder will pay \$250,000 in taxes for 2016, and will increase this amount by \$125,000 until reaching \$1 million in 2022.
- 3) Each Act 20 decree holder will begin with twelve (12) employees in 2016; for the following years, each new generation of decrees will increase this employment footprint by six (6) new employees, until reaching 50 employees per decree in 2022.
 - a. In other words, each new decree holder will have an employment footprint 6 units greater than the previous year.

Act 22 Assumptions

- 1) From 2016 onwards, Act 22 approved decrees will increase at a rate of 50%.
- 2) Each new Act 22 decree holder will pay \$25,000 in taxes for 2016, and will annually increase in \$4,167 until attaining \$50,000 in 2022.
- 3) Each new decree will generate (3) jobs throughout the period.

Limitations with the DDEC Approach – Act 20

- 1) The assumed growth is extremely sensitive to forecast errors. For example, the assumption of 100% growth, or yearly doubling of Act 20 decree numbers, was based upon the average growth from 2013-2015.
 - a. For the employment and revenue estimates, this margin of error is compounded by the error margin in the decree footprint. For example, if the decree footprint in

employment grew by 5 employees each year instead of the expected 6, there would be a discrepancy of 65,929 employees.

- 2) When using the hybrid-approach dataset by Estudios Técnicos, Inc., it is readily seen that the average Act 20 employment per decree for the 3-year period (without discounting outliers) is approximately 1.8 employees per decree per year; yet the DDEC forecast begins at 12.
 - a. The efficient scale for production in the service industry is not a constant function of time, but responds to technological, cost and market considerations. (contrast with manufacturing)
- 3) In 2022 alone, DDEC forecasts that 3,701 new Act 20 decree holders will produce 50 employees each, for a total job creation of approximately 185,000 employees. This implies that Act 20 firms alone would be able to produce as many jobs in one year as the entire retail sector in the island. The 610,934 cumulative employment estimate would double the size of the private sector in the island.
 - a. Important to take into account that relocation costs are much higher for larger establishments than for smaller ones. Also one has to take into account the available inventories of capital, real estate, infrastructure, permits or additional services that such large establishments may require.

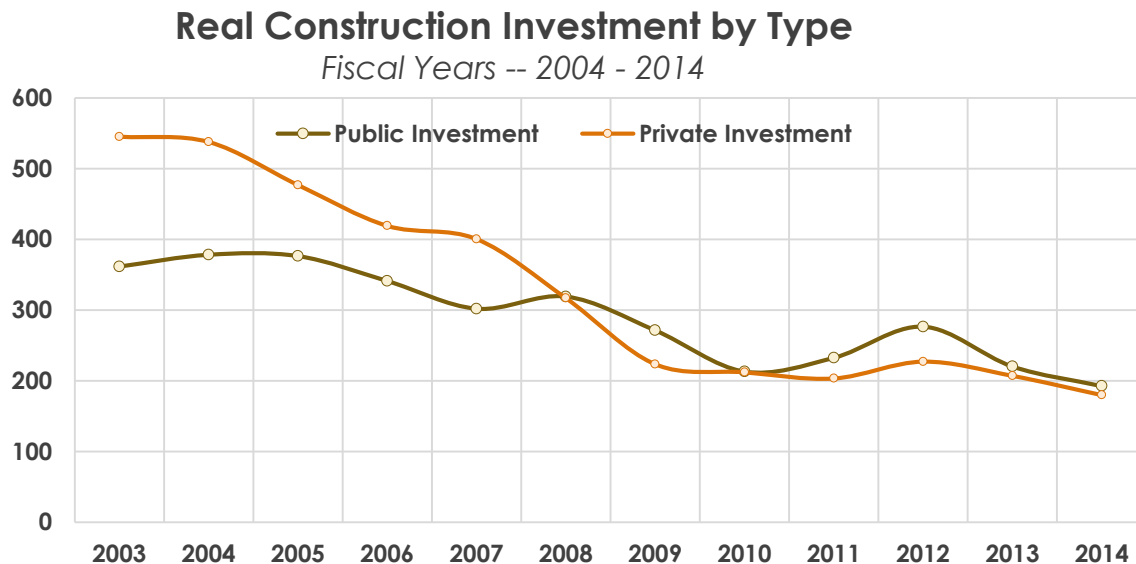
Limitations with the DDEC Approach – Act 22

- 1) As with the Act 20 forecasts, the total number is extremely sensitive to the growth assumption; a 5% increase would imply 3,353 more decrees are added at the end of the period, or 19.7% more than originally forecasted.
- 2) In 2022 alone, DDEC forecasts that 6,031 new Act 22 decree holders will produce 3 employees each, for a total job creation of approximately 18,094 employees.
- 3) Even in the empirical record, there exists more Act 22 decree holders than Act 20 decree holders, with an average growth of 251% -- or tripling every year. However, the current Act 22 forecasts present a lower number of Act 22 decree holders than in Act 20, contrary to current experience.
 - a. If we followed the same methodology as with Act 20, there would be an accumulated 99,000 decrees from 2016 through 2022 alone. This highlights the explosiveness of the Act 20 estimates, i.e. the methodology is highly sensitive to specific values in order to produce reasonable estimates.

Puerto Rico's capital investment vis-à-vis Act 20 & Act 22 incentives

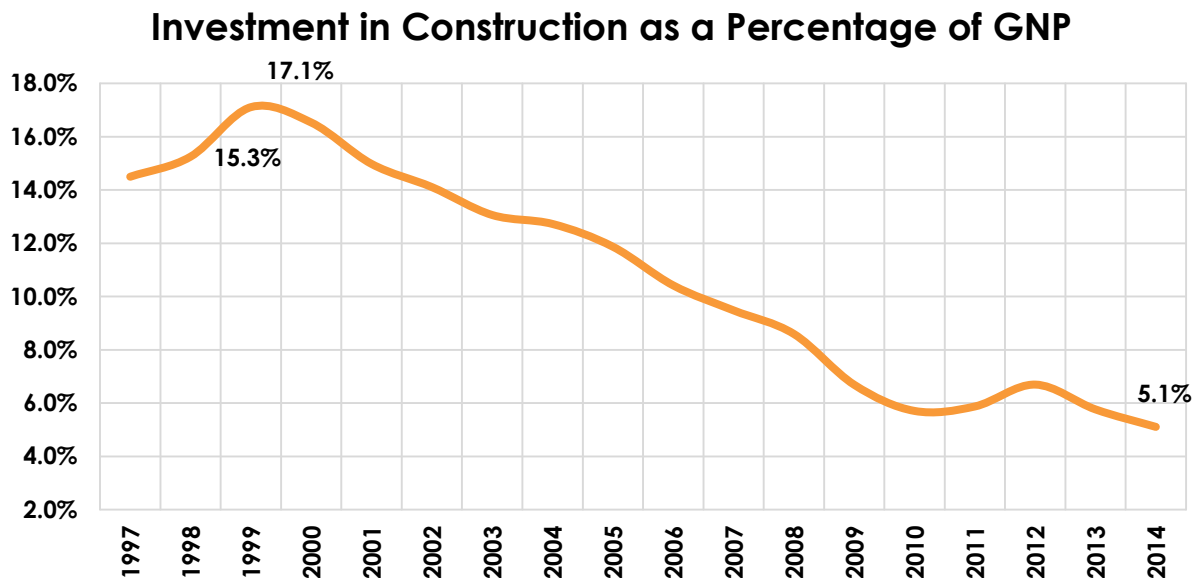
For the past years Puerto Rico has experienced a continued reduction in capital investments. As reflected in the National Accounts, Gross Domestic Fix Investment has been declining since 2005. Reduction in capital investment, particularly when adjusted by inflation and ignoring specific outliers such as ARRA funds, has been sustained for the past decade. In Puerto Rico more than half of all capital investment was attributed to the construction industry, however, due to the economic contraction experienced since 2006, now construction represents close to 39% of all investment. If construction investment was further broken down, housing construction will reflect a steep fall. The total investment in housing construction for 2014 represents 30% of the total housing construction of 2005.

The graph below highlights the reduction in construction investment from 2005 to 2014.



The investment in construction has reduced close to 5.7% annually since 2006, which contrasts with a 2.2% annual increase in the previous 7 years. Moreover, one of the main challenges for the local economy is to increase capital investments which usually bootstrap additional productive ventures. In 2005 investment in construction as a percentage of GNP represented close to 11.9%, yet, in 2014 such figure only amounts to 5.1%.

The graph below illustrates the downward trend of investments in construction as a percentage of GNP.



Act 20 and Act 22 Investments constituted a change in direction in the downward trend in capital investments. Due to the limited time these incentives have been in effect, aggregate change may not be reflected in the national accounts. Total investment in construction totaled \$3,534 million in 2014, out of these, private construction represented \$1,849 million (50% of total construction). Furthermore, since 2014 total investment in construction is close to \$2,000 million less than 2003 construction levels of investment.

Act 20 and Act 22 provide the enabling factors for creating new capital investments in the economy. By importing new capital, the economy has captured capital inflows which will add to the total investment figures in the following years. Taking into account the forecasts presented in the study, by 2020 Act 22 grantees will have demanded close to \$1,000 million in real estate investments (primarily housing) which will provide an injection of capital to the construction industry. Moreover, Act 22 grantees reported planned capital investments of \$228 million up to 2015. If this trend continues, the local economy should expect a boost in total investment from the private sector in the following years.

Status of the applications

The following table describes the various stages or status of the applications and/or reports in CRM.

Application/Report Status in <u>CRM</u>	Description
Cancelled	The applicant cancelled an application/report in the system. Change of Status in CRM occurs automatically.
Incomplete Application	The user has created an application/report using the Platform and is still in process. The application has not been submitted for OITE's approval. Change of Status in CRM occurs automatically
Incomplete Application	Once the application/report has been filled and required documents have been uploaded, except for the sworn statement. Application/report maintains the same status.
Submitted Online	Platform user submits the application in CRM with all required appendix for OICTE's review. Change of Status in CRM occurs automatically.
Complete Application	Once OETI reviews the application, and determines it is complete, the status is change to Complete Application by the user. The applicant receives a notification to proceed with the sworn statement.
Pending Filing	The applicant submits the sworn application in the supporting documents screen in the Platform. The application is identified as Pending Filing. Filing fees must be paid to OETI, for the case to be considered filed. Change of Status in CRM occurs automatically.
Filed	The applicant paid the filing fees. OETI's personnel make a manual change and identifies the status in CMR as Filed. This step begins the application approval period in CRM.

Additional References

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