

Demographic transition, limited fiscal space, and risks of breaking the intergenerational social pact: the Mexican experience[♦]

Abstract

This paper pursues two objectives. First, it shows that a combination of old government compromises together with a demographic transition can unbalance the fiscal loads of cohorts. Moreover, sensible reforms under a very tight fiscal space, may result in extremely negatively generational accounts for specific cohorts. We present a novel result: the measurement of the demographic bonus adjusted for fiscal transfers between working and non-working age groups. Our investigations finds that the adjusted demographic bonus may end earlier, that the bonus that only considers age dependency ratios. Second, with a political economy approach we assess the risks of a wrongful design of the fiscal system. Our discoveries show in a dramatic way that the Y generation (aka Millennials) will end up transferring significant resources to other cohorts and bearing considerable fiscal imbalances. Given, that this generation represents 34% of the Mexican population, the current fiscal design could be a source of social unrest and political tensions. In an extreme case, the intergenerational social pact may shatter.

Ricardo Cantú

Centro de Investigación Económica y Presupuestaria, A.C. (CIEP)

Héctor J. Villarreal

Centro de Investigación Económica y Presupuestaria, A.C. (CIEP)

Escuela de Gobierno, Tec de Monterrey

(This version June 2018)

[♦] This paper makes emphasis on results rather than methods. It relies heavily on CIEP's flagships reports on Education, Pensions, and Health (the three are available at www.ciep.mx) and on more theoretical research such as Cantu and Villarreal (2018). We are highly indebted to Villarreal's students during several public finance courses at Tec de Monterrey, and participants during various CIEP's Fiscal Simulator seminars taught by Cantú. A previous version of this paper was presented at ECLAC's Regional Fiscal Policy Seminar (Santiago de Chile, March 26-27, 2018).

Introduction

The social contract within any democracy assumes some degree of fiscal fairness among generations. This does not imply that a specific generation(s) could not be sacrificed. Neither, that several important issues have not been fully grasped: the financing of infrastructure, the sharing of economic gains driven by technological progress, etc. (Cantu and Villarreal 2018). Moreover, a combination of circumstances,¹ with sensible measures to preserve fiscal balances, and the commitment to respect former public policies, may result in very unfair “deals” for some cohorts. If this happens, together with strong equity considerations surge both, the need to assess the effects on the economy in terms of efficiency and potential political conflicts.

Risking some oversimplifications, in the following discussions we will refer to generations as follows. *Boomers*, those born in the period 1940-1959. *Gen-X*, those born in the period 1960-1979. *Gen-Y* (aka Millennials), born in the period 1980-1999. And finally, *Gen-Z*, as those born in the period 2000-2019². Of course, there are some overlapping regions in the generations (characteristics tend to be more similar with people closer in age of different generations, than among persons at the extremes of the same generation). Also, some generational traits are conditioned by non-age factors: education, income groups, localities, family background, etc. Nonetheless, we will stick to the former classification in order to keep the discussion tractable.

The central analysis will be based in an application of (Auerbach, Gokhale, and Kotlikoff 1994). Fiscal-cohort profiles will be estimated (and the generational accounts) calculated for different age groups. The two main components considered are all the federal taxes on the revenue side (including social security contributions), and public expenditures on education, health and pensions. There are other lesser elements integrated, but unless explicitly mentioned, they have a minor weight in the calculations.

Two caveats should be recognized. First, we are ignoring the role of subnational governments. Maybe, given the nature of the Mexican Fiscal System (MFS) this is not a major

¹ While random shocks may play a role, others are very predictable, posing formidable questions about the compatibility of short-run and long-run political economies.

² Of course we recognize the population born prior to 1940. We decided not to include this group in the analysis for two reasons. First, the availability of data regarding some key variables. Second, we would have been obliged to present an analysis of institutional transitions that is important for that cohort, and that is not a central theme in this paper.

limitation for the analysis.³ Second, and methodologically more difficult are the public investments in physical capital. We consider them, but as a uniform expenditure. As with all public goods, it is not straight-forward to differentiate their benefits among the population (cohorts).

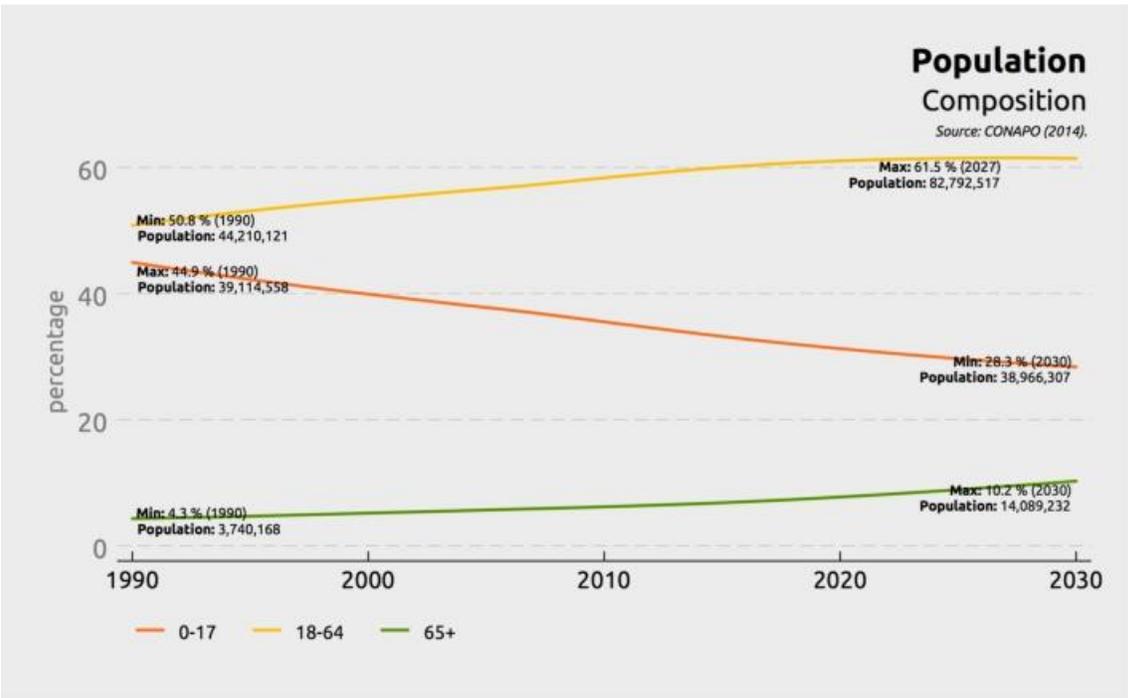
The paper is organized as following. In the next section we explain the settings of the most important variables and several changes that occurred. The third section is devoted to the government reaction in terms of policies. In the fourth section we do the adding up of circumstances, changes and policy reactions. We show our main results and present the imbalances of generational accounts. More than concluding, the final section is dedicated to analyzing the implications of our findings. We believe they are serious.

The settings

Since 1990, Mexico has experienced an increase of its working population, mostly balanced by the relative decrease of the young, according to the information estimated and published by CONAPO (2014). Back then, half (50.8%) of the people were between their 18 and 64 years of age and the other half (49.2%) were either younger or older (Figure 4.1). Now, in the year 2016, the structure has changed significantly: 60.3% are between this age range, an increase of almost 10 points, 39.7% are otherwise (Graph 1). Specifically, the population older than 65 years increased, in the referred period, by only 2.7 points.

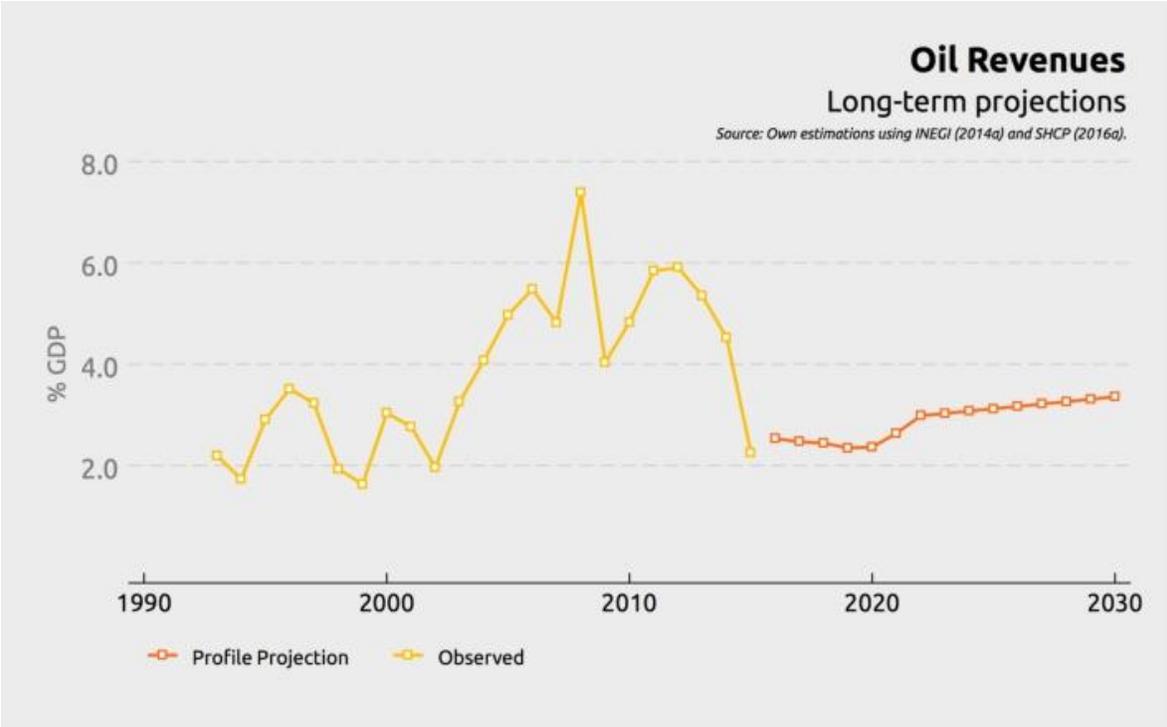
However, demographic projections expect that these figures will change in 2030 in another significant way: the prime-age population will remain relatively constant, representing 61.4% of the population, and those older than 65 years of age will grow up to 10.2%. This means that the expansion of this age group in the next 14 years will be more accelerated than in the last 26 years altogether. Moreover, it is expected that in the period 2030-2040 this age group would change from being a little more than 1 in 10 of the Mexican population, to almost 1 in 5, that is something deeply structural in terms of demographic changes.

³ Most revenues in the MFS are of a federal nature, a so are the lion's share of public expenditures in education, pensions and health.



Graph 1

It is important to mention that the demographic transition will pose important challenges for education, pensions, and health. The government reaction to these changes and the restrictions encountered will be described in the next section.



Graph 2

A second important issue originates in the drastic reduction in net⁴ oil revenues faced by the MFS. The period 2003-2014 witnessed an extraordinary windfall of oil-driven public revenues (Graph 2). These resources allowed that modest tax revenues (below 10% of GDP if social security contributions are excluded) could stand-up for more than a decade.

Things changed. Suddenly, international prices collapsed, Mexican oil production dropped (from 3.5 MMBD to slightly less than 2 MMBD), and production costs increased considerably. Other troubles include the extinction of the Mexican star oil camp (Cantarell), and that nowadays most production is of heavy oil, cheaper and more difficult to refine in comparison with the lighter variations. So oil revenues that averaged more than 5% of GDP for a long period, barely account for 2% of at present. It can be argued, that Government's projections shown in (Graph 2), are too optimistic.

The policies

The public sector reactions to the aforementioned events and circumstances was diverse and with different degrees of success. To some extent, the “structural reforms” of the period 2012–2015 intended to become a modernization wave for the economy and the state⁵.

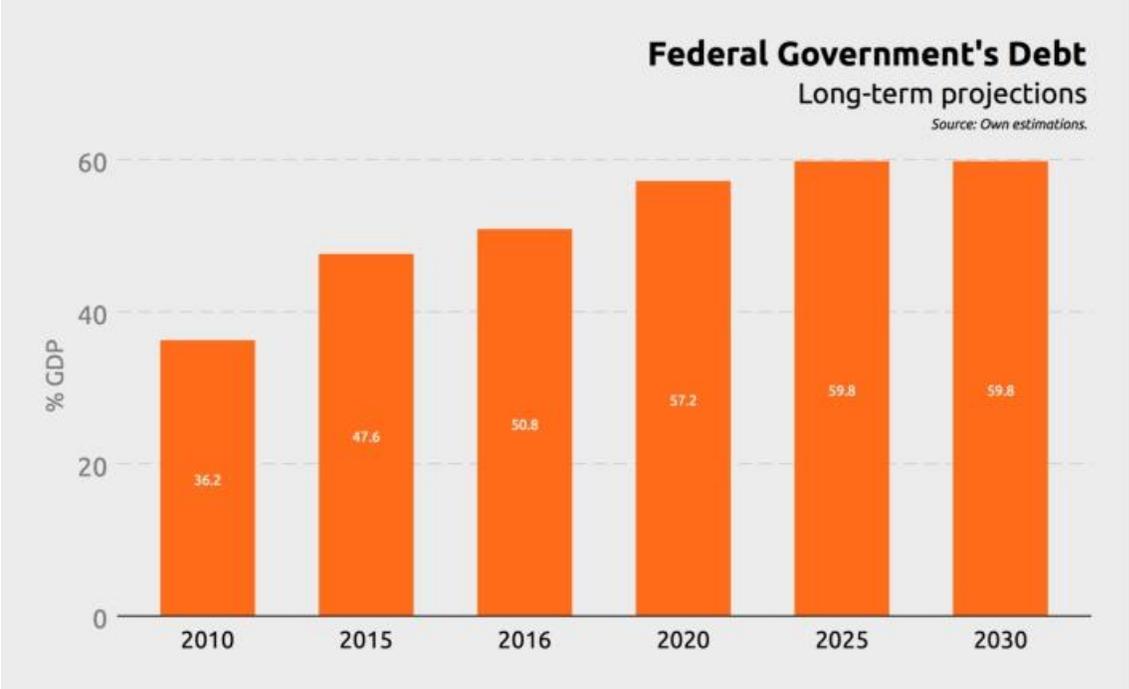
It is not within the scope of this paper to assess the effects of the structural reforms. However, we want to make the point, that despite deep changes in public policies and to some extent in key sectors of the economy, little was made in terms of intergenerational public finance balances. There is still the need to incorporate the demographic approach in core policies. Also, while the Fiscal Reform was able to rise tax revenues, the increments are not enough to compensate the lost oil revenues. Once you consider the effects of contingent liabilities (like pensions and health expenditures), there is an extraordinary tension within the MFS (Moreno-Brid, Perez, and Villarreal 2016).

A consequence of having intergenerational fiscal imbalances is that public policies are needed to solve the public finance system. But, in order to discuss possible policies, an assessment of the fiscal space (IMF 2016) is necessary. A very classic definition of fiscal space is

⁴ Not considering the value of the operations of the oil state Company (PEMEX). That is, net oil revenues are resources that could public policies outside the sector.

⁵ The current administration (2012-2018) generated a vast political alliance called “Pacto por México”. With broad support in the political spectrum a series of reforms in the financial sector, public finance, energy sector, education, to name the biggest ones, were passed in Congress. Some of its elements were unimaginable some years ago, i.e. private participation in the oil industry.

employed in this analysis: what is the government’s margin to increase public expenditures or reduce tax revenues, without compromising the sustainability of public debt in the long-run. The availability of fiscal space is critical, if non-existent, than before implementing policies, fiscal reforms are needed in order to give government degrees of freedom.



Graph 3

Graph 3 shows the projections of the Mexican public federal debt to GDP ratio, employing CIEP’s Fiscal Simulator⁶. We should insist this is a projection rather than a forecast. That is, we model individual tax revenues and principal public expenditures and add them up under a General Accounts framework (Auerbach, Gokhale, and Kotlikoff 1994). Under this logic, the debt stock is the sum of the fiscal residuals of each year. Graph 3 is the projection presented in (Cantu 2016), were the decomposition of each element can be found.

The increased in Debt / GDP ratios in the period 2010-2015 triggered a series of adjustments in public expenditures. There is a non-trivial discussion to what extent these adjustments were a fiscal consolidation, or if it is more a forced austerity. Among the “victims”, public investment in infrastructure has plummeted. This can have dramatic effects in medium

⁶ Available at, <http://simuladorfiscal.ciep.mx/>.

and long-run growth (Moreno-Brid, Perez, and Villarreal 2016). The adjustments in the central variables discussed at the introduction (education, pensions, and health) were more guided by their particular constraints, rather than following an integral design.

In the case of education, Mexico has struggled to expand public expenditures in middle (high school) and upper levels (college, graduate school). Political agreements (teachers' unions) have nurtured increments in basic education expenditures (mostly salaries) despite a reducing population in that level. Together, with austerity policies, middle and upper levels, with higher returns on education, have been squeezed in terms of public expenditures. Lower income groups have very limited access to college. It is not just about tuition, but less well-off youth, usually face very high short-run opportunity costs (CIEP 2016).

Pensions, represent maybe the biggest public finance challenge for Mexico in the short run. The switching from defined benefit (pay-as-you-go) to a defined contribution (individual accounts), without financial reserves has jeopardized the system. Currently, almost all revenue gathered by VAT, Mexico's second tax in importance, are spent in public expenditures regarding the federal pension system. These expenditures will show a steady growth in terms of GDP until year 2028. Moreover, these expenditures are extremely regressive. They are so onerous, that restrictions are posed not only on other pensions schemes (non-contributing, subsidies to voluntary retirement savings), but they are also a considerable burden for every alternative public expenditures (CIEP 2017).

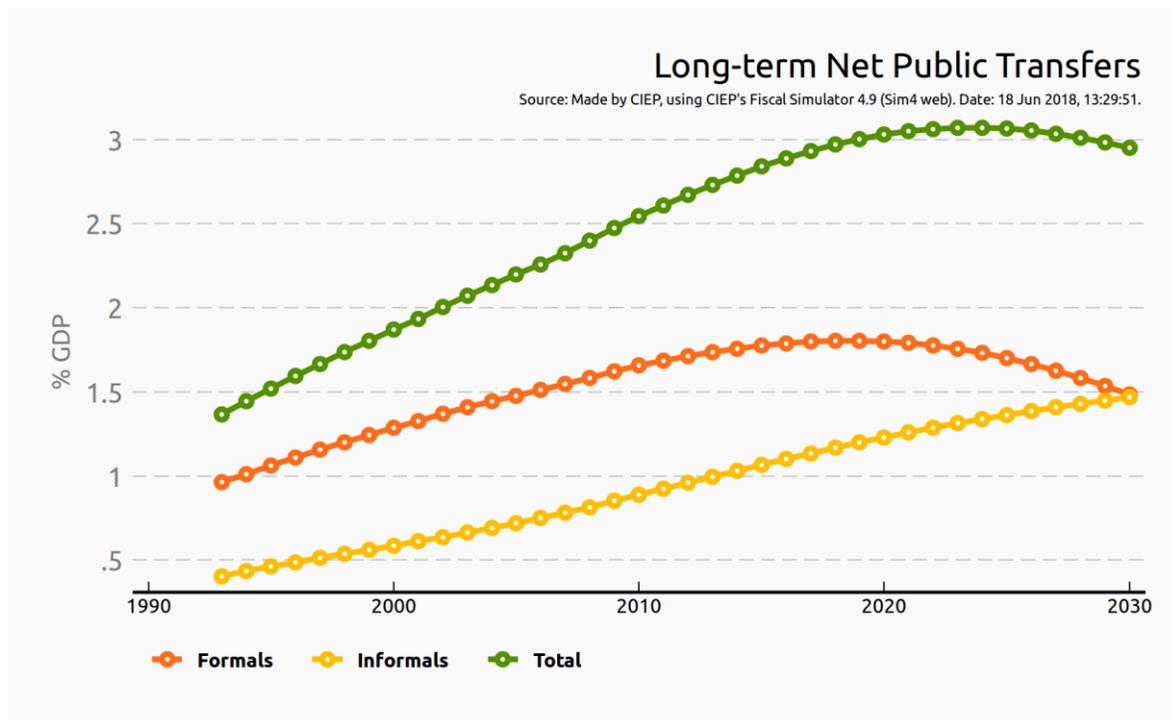
In terms of long-run potential problems, the Mexican Health System is maybe worst. So far, about one-sixth of the population (around 20 million people) are not covered by any public health subsystem. In the available ones, the services provided can be highly unequal. The demographic transition is coupled with an epidemiological transition, with a constant increase in chronic diseases. Not only are financial reserves almost non-existent, but in recent budgets health expenditures have been trimmed to cope with public expenditures in pensions, debt service, and the like. While the desirability of a universal health system is widely acknowledged, it would be very difficult to find the necessary resources with the existing fiscal space (CIEP 2018).

Results and uncomfortable truths

So far we have discussed many problems and challenges regarding public finances in Mexico. In this section we will go back to the core question of the paper. Is the intergenerational social pact at risk in Mexico? To answer that, we would take two approaches, both derived from Generational Accounts methodology. Please refer to Appendix A for a brief review of the model employed in this paper.

Net transfers as an alternative measure of the demographic bonus

The standard idea of a demographic bonus relies on plateau that occurs during demographic transition. It refers to a period of time where the dependency ratio, children plus elder as percentage of the total population is relatively low. The direct implication is that a society during this period has a lot of persons in working age. Thus, it is a natural opportunity to exhibit high economic growth, formation of capital, and general increases in the standards of living.



Graph 4

We revisit the concept of demographic bonus with a related but a little bit different definition. It is possible to define “net transfers” as the balance between tax revenues⁷ and expenditures in education, pensions and health. That is:

$$\text{Net Transfers} = \text{Tax Revenues} - \text{Education Exp.} - \text{Pensions Exp.} - \text{Health Exp.}$$

The calculations can be performed for the whole population or diving between formal and informal workers⁸. Graph 4 presents the results employing CIEP’s Fiscal Simulator to calculate projected net transfers for the following years. Results are very interesting.

First, as expected net transfers increase as the dependency ratio lowers. This makes sense given that as population in working age increases, government spends less in education and this age groups puts little pressure on the public health system and negligible in pensions. So, when this transition occurs it is ideal for the public sector to increase investments in public infrastructure or to reduce debt (in the last years the opposite has happened in Mexico). However, the demographic bonus measured with the net transfers have an inflection point earlier (almost a decade) than the demographic bonus as measured with just the dependency ratio. The intuition is that on average pensions + health for elder are more expensive than education + health for children.

Second, and quite strong, the net transfers’ inflection points happen on very different years for formal versus informal workers. As far as 2030, there is not an inflection point for the informal group. Given that informality correlates with lower income levels, under these conditions, the MFS can show important regressive effects. The intuition behind the result is that participants in the informal labor market are younger on average, are attended on less-well funded public health subsystems, and that they will receive a frugal non-contributory pension (if any).

⁷ Considering social security contributions.

⁸ All household members are considered formal or informal according to the labor status of the principal household income. In cases where there is no labor income (e.g. elderly households) formality is defined based on social security conditions.

The generational accounts of different cohorts

In this section we take the question of intergenerational justice from another angle. We will use the classification proposed at the beginning of the paper, and in a heuristic analysis summarize the implications for the social (fiscal) pact of the settings-policies described previously. Most of the results are compiled from (CIEP 2016, CIEP 2017, and CIEP 2018).

Before proceeding, we would like to introduce the notion of “remaining general account” (RGA). By this, we mean not the complete generational account of a specific cohort, but rather the present value of the pending (contingent) average generational account conditioned on the remaining expected life years of that cohort.

Boomers (1940-1959). The RGA of this cohort is negative (as expected) and of considerable magnitude by standards of the MFS. The lion’s share of these transfers refer to pensions. Maybe the trouble for this group is related to heterogeneity. While part of this generation is receiving (or will receive) a very generous pension, other will have a petite one (if any). This cohort had important direct and indirect benefits of the oil boom.

Gen-X (1960-1979). The pass of this generation through the MFS is more mixed. On the one hand they received substantially more public education than the Boomers. Part of the cohort (in the formal sector) participates in the old pension system (more generous) and part in the new one. While many lived economic crises as children, their adulthood has had considerable economic stability, albeit small economic growth. If not thriving, they have on average better standards of living than the previous generation. Health may be a concern in the future, particularly for those outside the private and best public subsystems. Their RGA is positive but small in magnitude.

Gen-Y (1980-1999). This cohort may be the big loser of the MFS. While, they received on average much more education years on the public system, for many the quality of that education is an issue. Second, their share of the oil boom revenues is marginal. Third, the Millennials fully faced the change in the pension system. Almost all of them, are in the new (defined contribution) system. So, they have to save for their pensions, but will pay a considerable part of Boomers and Gen-Xs pensions. Given the coincidence of the peak labor income, with the chronic diseases stage of the Boomers, to the extent that the MFS relies on income tax revenues, they would finance also a chunk of that. To make things worse, their labor market is more competitive and

unstable that the one faced by Gen-Xs. So their economic well-being after retirement is complex. Their RGA is very big, potentially enormous.

Gen-Z (2000 – 2019). Their RGA is still very speculative, with the dynamic profiles highly uncertain. Nonetheless, three elements may be their allies. First (unless policy changes), the fiscal imbalances they could face are radically smaller the ones present in the Millennials profiles. Second, a better labor market, at least for skilled workers. In third place, outside of a strict fiscal logic, but very important and (maybe) relevant for public policy, the Gen-Z may be richer due to important capital transfers from the Gen-X.⁹

Implications

Maybe the stability of the social (fiscal) pact is given for granted. This research visions that a combination of foreseeable circumstances plus some shocks may put a lot of tension on a fiscal system. An accelerated demographic transition changed heavily the requirements of the population. The reliance on revenues from a non-tax source allowed the existence of a weak tax system. The Mexican Fiscal System was pressured from both the revenues and expenditures side. Thus fiscal space contracted dramatically.

Public policies have intended to accommodate to the new reality. However, many of these would have effects on the long-run, leaving a lot of immediate problems untouched. Second, the MFS appears rather fragile, and expenditures' control seems more a forced austerity rather a fiscal consolidation. The demographic approach to policy is mostly absent from most discussions.

There are two strong findings in this paper. We present an alternative approach to measuring the demographic bonus, based on net transfers (tax revenues minus education, health and pensions public expenditures) versus the standard dependency ratio. In this line, the demographic bonus will end up earlier that quantified traditionally. The intuition is that while remaining in a low depend ratio plateau, the exchange of children for elders is not fiscally neutral, the later require higher transfers.

⁹ More than Generational Accounts, to grasp those effects a National Transfers Accounts (Lee and Mason, 2011) approach is needed.

Our second finding, is that important fiscal imbalances between generations may exist, but are absent from policy discussions. In particular, our results suggest that the Gen-Y (Millennials) may be the big losers of the intergenerational pact. To the extent, that they represent an enormous part of the population (and the electoral list), both issues of generational fairness and political stability emerge.

A fiscal reform would be necessary to both create fiscal space that could foster necessary public policies, and that would mend current fiscal imbalances among generations. A big concern remains if the institutional arrangements in the country can support that kind of reform, and if it would happen timely.

Bibliography

Auerbach, A. J., Gokhale, J., and Kotlikoff, L. J., (1994), “Generational Accounts: A Meaningful Alternative to Deficit Accounting”, *The Journal of Economic Perspectives*, 8(1):73–94.

Cantu, R., (2016), “Fiscal System 2.0: Achieving Redistribution and Sustainability”, Ph.D. Dissertation, Escuela de Gobierno, Tec de Monterrey, Mexico.

Cantu, R., and Villarreal, H.J., (2018), “Some Issues about Fiscal Intergenerational Fairness”, CIEP Research Papers Series.

CIEP (2016), “Gasto Público para una Educación de Calidad”, <http://gastoeducativo.ciep.mx/>, Micrositios, Centro de Investigación Económica y Presupuestaria, A.C., Mexico.

CIEP (2017), “Las Pensiones en México”, <http://pensionesenmexico.ciep.mx/>, Micrositios, Centro de Investigación Económica y Presupuestaria, A.C., Mexico.

CIEP (2018), “El Sistema de Salud en México”, <http://saludenmexico.ciep.mx/>, Micrositios, Centro de Investigación Económica y Presupuestaria, A.C., Mexico.

CONAPO (2014). “Proyecciones de la población 2010-2050”. Technical report, Consejo Nacional de Población, Mexico.

IMF (2016), “Assessing Fiscal Space: an Initial Consistent Set of Considerations”, Staff Paper, International Monetary Fund.

INEGI (2014b). Encuesta Nacional de Ingresos y Gasto de los Hogares 2014. <http://www.inegi.org.mx/est/contenidos/proyectos/encuestas/hogares/modulos/mcs/default.aspx>.

Lee, R. and Mason, A. (2011). *Population Aging and the Generational Economy: A Global Perspective*. Edward Elgar Publishing, Massachusetts, USA.

Moreno-Brid, J.C., Perez, N., and Villarreal, H.J., (2016), “Austerity in Mexico: Economic Impacts and Unpleasant Choices Ahead”, *World Economic Review*, 7, 56-68.

Appendix A

Profiles

Profiles—or *lifecycles*—are graphic and non-parametric descriptions of an economic flow across ages and sexes, adjusted to match a macro control. They summarize *observed* decisions from people of all ages and sexes, given the choices, opportunities, and circumstances available in a specific region for a particular time of reference. Our case study is Mexico, depicted through the ENIGH 2014 (INEGI 2014) household survey. Age profiles represent how individuals’ economic decisions are, again, *expected and assumed* to evolve through their lives. Figures at the end of the chapter display three key concepts:

Per Capita

It is the statistic of reference obtained by dividing the account size by the total number of persons living in the country. When required (and specified), the *per capita* will be conditioned to a particular subsample population.

Per Capita Equivalent

It is the *y-axis unit value* that represents the standardization of the account for each age, by the—conditioned or unconditioned—*per capita* previously described¹⁰.

Distribution

It describes the profiles’ distribution or participation by age, where the sum of all values equals 100%.

Profile Projections

Assuming age profiles are constant and using Mexico’s population projections, it estimates public revenues and expenditures, identifying and acknowledging time variations due to demographic pressures—*ceteris paribus*. Equation [eq:projections] exhibits the procedure.

$$Proj_{i,k} = pc_k * (PCE'_{j,men,k} * MEN_{j,i,k} + PCE'_{j,women,k} * WOMEN_{j,i,k})$$

Where,

Proj_i

Projection vector.

pc

Per capita scalar.

10 For example, if the *per capita* value is of \$100 MXN and, at age 50, men have a per capita equivalent value of 5.0, it means that men produce on average \$500 MXN (5.0 times \$100 MXN) at age 50.

PCE

Age profile matrix (in per capita *units* or equivalences).

MEN and WOMEN

Population matrices.

i

Year dimension.

j

Age dimension.

k

Revenue or public expenditure account (dimension).

Given that pc_k is a scalar for each k account, estimate variations along time would be expressed in 2014 MXN (the baseline derived from the harmonization between the SNA 2014 and the ENIGH 2014 survey), and, hence, changes in time would be expressed in real terms. However, pc can be transformed into a vector that conveys changes over time (i.e. $pc_{i,k}$), for instance, by assuming an exogenous productivity growth (GDP real growth was used in our projections).

Now, when projections are made for a restricted or conditioned sample (e.g., only people paying taxes or receiving public education), equation [eq:projections2] is used, which has a different matrix: a participation profile by sex and age.

Participation

This element represents the percentage of people by age and sex that participate in the production or consumption of the respective account or variable k (e.g., paying taxes or receiving public transfers).

$$Proj_{i,k} = pc_{i,k} * \left((PCE'_{j,men,k} \circ PART'_{j,men,k}) * MEN_{j,i,k} + (PCE'_{j,women,k} \circ PART'_{j,women,k}) * WOMEN_{j,i,k} \right)$$

Where,

pc_i

Per capita vector.

PART

Participation matrices.

Although projections from equations [eq:projections] and [eq:projections2] are equivalent (because $pc_{i,k}$ would be restricted and, therefore, readjusted by the conditioned number of people captured in $PART_k$), they are differentiated for two purposes. The first is to allow changes in public policies that would ultimately end with an increase in taxes ($pc_{i,k}$). The second is to allow changes regarding law enforcement and formality ($PART_k$). Equation [eq:projections2] is for the flexibility of designing scenarios of a fiscal system that are capable of transforming the $pc_{i,k}$ vector—the PCE_k matrix, the $PART_k$ matrix, or any combination of these for both males and females.