

## WORKING PAPER

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# **The Italian NDC Scheme: Evolution and Remaining Potholes**

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*Sandro Gronchi*

*Sergio Nisticò*

*Mirko Bevilacqua*

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**Sandro Gronchi**

[sandro.gronchi@uniroma1.it](mailto:sandro.gronchi@uniroma1.it)

**Sergio Nisticò**

[s.nistico@unicas.it](mailto:s.nistico@unicas.it)

**Mirko Bevilacqua**

[mirko.bevilacqua@gmail.com](mailto:mirko.bevilacqua@gmail.com)

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Corso d'Italia 33  
00198 Roma, Italia

Tel. +39 06854471  
Email: [urp@inapp.org](mailto:urp@inapp.org)

[www.inapp.org](http://www.inapp.org)

## ABSTRACT

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# The Italian NDC Scheme: Evolution and Remaining Potholes\*

Starting from a reconstruction of the political context in which the Italian 1995 pension reform took shape, this paper reviews the essential features of the 1995 and post-1995 legislation and assesses its fundamental shortcomings. A straightforward theoretical discussion highlights both the targets and the instruments representing the hallmark of the nonfinancial defined contribution (NDC) model. The contrast of such theoretical premises with the Italian legislation points out the persistent original mistakes together with the necessary remedies.

**KEYWORDS:** Italy, Pensions, NDC

**JEL CODES:** H55, J18, J26

### Abbreviations and Acronyms

|       |                                     |
|-------|-------------------------------------|
| GDP   | Gross Domestic Product              |
| NDC   | Nonfinancial Defined Contribution   |
| OASDI | Old-Age, Survivors', and Disability |
| PAYG  | Pay-As-You-Go                       |

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## 1. Introduction

In early 1995, after President Berlusconi resigned for not getting his parametric pension reform approved, a wide Parliamentary coalition endorsed a “technical” government to lead the country in view of the general elections to take place no later than spring of 1996. The main task of the new cabinet, led by the former General Director of Bank of Italy Lamberto Dini, was to pass a significant reform of the Italian pension system in due time, to overcome the financial difficulties announced by long-run projections.

A paper written by one of this paper’s authors, then an advisor to the Ministry of Treasury, denounced the inequities of the earnings-related scheme while pointing out the remedy in what is now labeled the nonfinancial defined contribution (NDC) scheme (Gronchi 1994). The new scheme also promised to remedy long-run budget imbalances. The proposal circulated among experts and union leaders and also inspired a bill, presented in December 1994 by the majority of left representatives in Parliament, roughing out an NDC system. The Dini government explored these new ideas, appointing a reform working group that included the author of the above-mentioned paper. Although the group did not have to start from scratch, the government deadline was very narrow.<sup>1</sup> This peculiar political context explains the shortcomings of Dini’s reform, never remedied since then.

For union members to endorse the radically new form of the pay-as-you-go (PAYG) system, its impact had to be delayed. Indeed, senior workers with a contribution record of at least 18 years were fully exempt, while those with a shorter record had to be concerned pro rata only, with the weight of old rules depending on the ratio of the pre-1995 to the overall contribution period at retirement. Not surprisingly, the 1995 legislation did not produce any practical effect. The more recent 2011 Fornero reform had the merit of fostering the transition with the provision that contributions paid in the system since 2012 produce pension credits according to NDC rules, independent of the aforementioned 18-year contribution record.

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<sup>1</sup> For a detailed reconstruction of Italian NDC antecedents, see Gronchi and Nisticò (2006, note 6).

Therefore, all pensions awarded since 2012 have an NDC component. Now that the Italian NDC is leaving the “waiting room” where it has remained trapped since 1995, identifying and remedying its shortcomings can no longer be deferred. In fact, Italy must now decide whether to “fully implement the NDC system or explicitly move to other solutions” (Franco and Sartor 2006, 484).

The main purpose of this paper is to discuss the Italian system’s shortcomings. It first summarizes the pension-related legislation since 1995 and presents current figures characterizing the Italian pension system.

## **2. Overview of Italy’s post-1995 pension legislation**

One essential feature of Italy’s post-1995 pension legislation is its instability. Moreover, the long transition mentioned above explains why frequent changes were passed by governments mainly concerned with retirement rules for workers exempt, fully or partially, from NDC rules.

The 1995 reform prescribed a 57–65 age interval for fully NDC workers (i.e., those with a contribution record starting from January 1, 1996), and confirmed a standard retirement age for pre-1996 workers at 60 for women and 65 for men. The pre-1996 workers were also allowed to retire earlier, starting at 57, provided they had contributed to the pension system for 35 years. Moreover, “seniority retirement” (regardless of age), very rooted in the Italian social security tradition, was confirmed and extended to post-1995 workers but the required contribution period was raised from 35 to 40 years.

After the 1996 general elections, the center-left Prodi government passed new measures mostly concerned with convergence of retirement rules for public employees toward those already established for the private sector. Adequate pensions played a fundamental role in 2001 Berlusconi’s electoral campaign, and the first law passed by his second government was meant to keep the promise of raising the €350 minimum pension up to €516. The “minimum pension” is a floor for earnings-related pensions that, if lower, are “integrated” up to such floor. This minimum pension will not survive the transition period, since the Dini reform ruled it out for fully NDC pensions.

In 2004, according to the so called “Maroni reform,” named after Berlusconi's Minister of Welfare, the required age for pre-1996 workers’ early retirement with 35 years of contributions was raised from 57 to 60 as of 2008, to 61 as of 2010, and to 62 as of 2014. Surprisingly, such rules were extended to fully NDC post-1995 workers. The standard retirement ages of 60 for women and 65 for men, regardless of the contribution period, were maintained for former workers and also extended to the latter. In such a way, the 57–65 flexibility of the 1995 NDC scheme was completely lost. In the end, the seniority retirement after 40 years of contributions was preserved.

In summary, after Maroni's law all workers (both pre-1996 and post-1995) had three “exit channels”: the first was based on age (60 or 65 depending on gender); the second was based on seniority (40 years of contributions); and the third was “mixed,” requesting both 60 years of age and 35 years of contribution seniority. This third channel was relevant for men only since the first one allowed women to retire at 60 regardless of seniority.

In 2007, after the center-left coalition won the 2006 general elections, Prodi's second government replaced the third channel with a different one, based on the concept of “quota,” that is the sum of age and seniority.

The required quota was set at 95 (with a minimum age of 59) to be raised up to 97 (with a minimum age of 61) as of 2013. The required quotas (and minimum ages as well) were raised by one year for the self-employed. Prodi's 2007 law also updated the divisors of the NDC, which had to be done in 2006 by the Berlusconi government given that the 1995 reform established updating every 10 years.

Indeed, the updating procedure envisaged in 1995 was not automatic but rather based on a troublesome political process that the Berlusconi government could easily escape (before the political elections). The Prodi law abolished such political process and established automatic updating every three years (instead of ten).<sup>2</sup>

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<sup>2</sup> The 2007 Prodi law did not change the awkward “*erga omnes*” nature of the Italian divisor, discussed in section 6.3.

In 2008, the Prodi government resigned and Berlusconi won the elections once more. The most significant change in the pension legislation introduced in 2010 by the new Berlusconi government was the indexation to longevity of the retirement ages required for the first exit channel mentioned above. The new cabinet remained in force until November 2011, when Berlusconi resigned under financial market pressure.

A technical government followed, led by the former European Commissioner Mario Monti. His new Minister of Welfare was Professor Elsa Fornero, who passed a radical reorganization of the chaotic Italian retirement rules, besides fostering the slow transition mentioned above. The main features of the 2011 Fornero law were:

- Cancellation of Prodi's quotas;
- Restoration of flexibility for fully NDC post-1995 workers within a longevity-indexed age interval that will be 64–67 as of January 1, 2019;
- Gradual convergence for pre-1996 workers toward a unique longevity-indexed retirement age (regardless of gender and working category) that will become 67 years as of January 1, 2019;
- Preservation of seniority retirement but with higher, longevity-indexed contribution records, different by gender, that will become of 42 years and 3 months for women and 43 years and 3 months for men as of January 1, 2019.

The law also established updating of NDC divisors every two years (instead of three) as of 2019.

### **3. Pension expenditure: Structure and evolution**

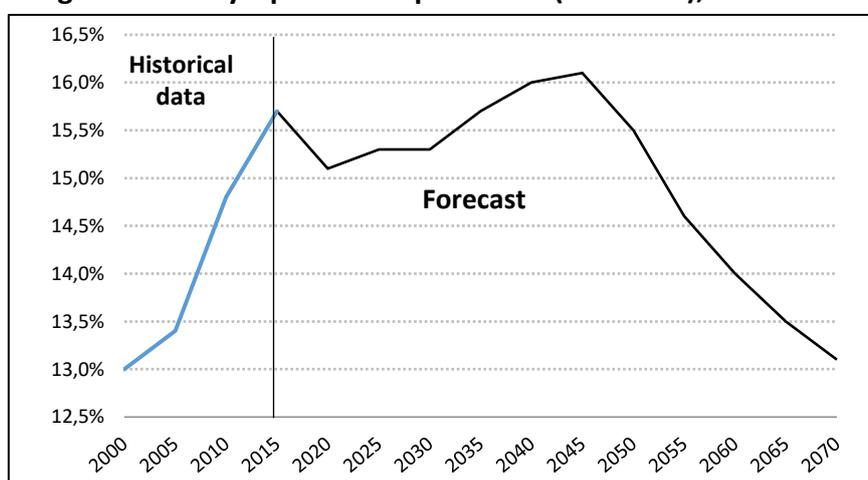
Italy's 2017 expenditure on old-age, survivors', and disability (OASDI) pensions amounted to around €250 billion (14.5 percent of gross domestic product [GDP]), of which €197 billion (11.4 percent of GDP) was for old-age benefits, €39.5 billion (2.3 percent of GDP) was for survivors' benefits, and €13.5 billion (0.8 percent of GDP) was for disability benefits.<sup>3</sup> In

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<sup>3</sup> The figures reported in this section are taken from INPS (2018a, 2018b).

January 2018, the number of disbursed OASDI benefits was around 17 million, 14 million of which went to former private employees or the self-employed, and the remaining 3 million to public employees. On the other hand, overall OASDI revenues, generated by a 33 percent contribution rate, amounted to around €190 billion, covering only 76 percent of expenditures.<sup>4</sup> The remaining part was financed by the state. Regarding adequacy, the average amount of the 12 million old-age pensions is €2,100 per month for public employees, €1,360 for private employees, and slightly below €900 for the self-employed. The corresponding pension levels (i.e., the ratio of average old-age pension to average earnings) amount to around 85 percent and 70 percent for public and private employees, respectively, and to around 50 percent for the self-employed. Note that all these figures have little to do with the NDC's effects, since fully NDC pensions are still few. Moreover, their levels are very low because of the short careers of beneficiaries. According to official projections of the State General Accounting Office, in 2070 pension expenditure relative to GDP will go back to the pre-2005 level (Figure 3.1).<sup>5</sup> The main reasons are the increase in retirement age and the phasing out of the “baby boom” cohorts.

**Figure 3.1: Italy's pension expenditure (% of GDP), 2000–2070**



Source: RGS 2018.

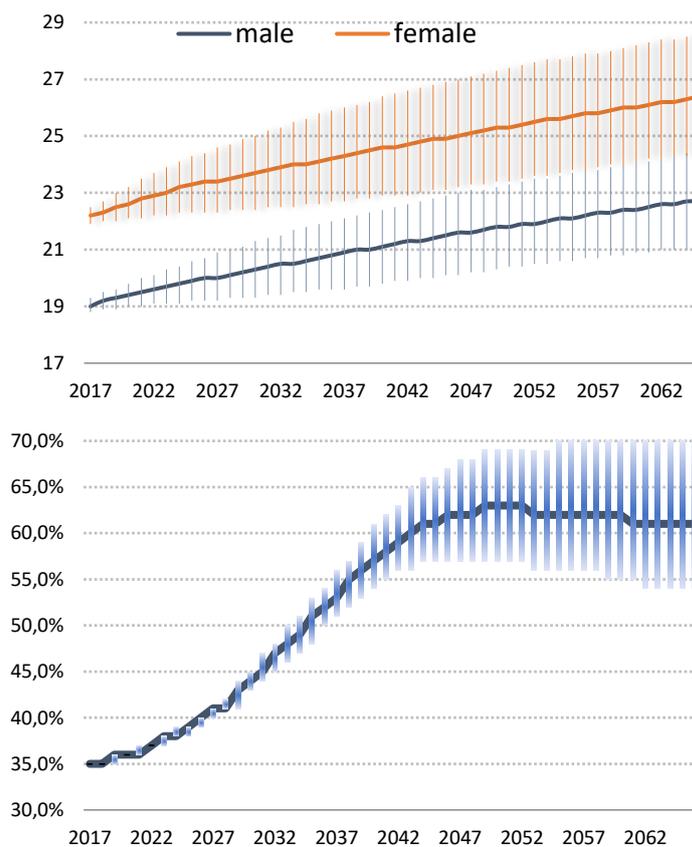
<sup>4</sup> One-third (9 percent) of the rate is paid by employees, and the remaining two-thirds (24 percent) by employers. Such contribution rates are the same for fully NDC pre-1996 workers and others.

<sup>5</sup> The acronym RGS reflects the Italian name of the State Accounting Department (Ragioneria Generale dello Stato). Note that RGS's pension expenditures include social allowances. Because of the dramatic demographic prospects reported in Figure 3.2, RGS's long-run projection might prove to be optimistic. For a detailed discussion of the underlying assumptions, see Andrieu et al. (2018, 17–19).

Nevertheless, it cannot be denied that due to Italy's demo-economic perspectives, fully NDC pensions, starting on a large scale in the 2030s, will be lower than those Italian retirees are now used to; thus the number of those pointing to the NDC as the principal enemy of Italian retirees will probably increase at that time. They should understand that, in the absence of the NDC, sustainability should be ensured by some parametric adjustments affecting earning-related pensions as well. In fact, the real “enemies” are demographic changes and slowing productivity growth, while the NDC can only ensure that the necessary sacrifices are timely and fairly distributed. The expected increase of both life expectancy and the old-age dependency ratio for Italy are shown in Figure 3.2.

**Figure 3.2: Life expectancy and old-age dependency ratio in Italy, 2017–2065**

Life expectancy at 65 (years) Old-age dependency ratio (%) (number of people aged 65 and over as % of labor force, aged 15–64)



Source: ISTAT 2018.

Note: The bold lines show the median scenario; the vertical bars show the 90% confidence interval.

#### **4. The “last call” for a definite choice**

The NDC philosophy represents such a clear-cut cultural discontinuity that it took Sweden around six years of political debate and technical work to develop coherent legislation; and Swedish experts are still working on the many technical details that allow the new system to couple fairness and transparency with the automatic adjustments needed to keep pace with the country’s ongoing demographic scenario.

Nothing of this sort took place in Italy. The short time the Dini government had available did not allow a proper debate on NDC’s principles; after that, such a debate was not encouraged by the long transition mentioned above.

The time has come for the political and cultural debate that Italy has deferred to date. The rest of this paper is intended to be a stimulus in this direction.

In the absence of a shared theoretical benchmark, both shortcomings and remedies are debatable.

Thus section 5 discusses the theoretical framework necessary to “disclose” them. Section 5.1 identifies the NDC goals, or “targets” in Tinbergen’s (1952) terminology. Section 5.2 focuses on the technical tools, the “instruments” that allow those targets to be reached in “well-behaved” economies, where both employment growth rate and longevity are constant over time. Section 5.3 discusses how to adapt the instruments to the “real world,” in which employment growth is not steady and longevity increases. Section 6 contrasts such theoretical premises with the 1995 Italian legislation, pointing out the mistakes together with possible remedies. Section 7 concludes.

#### **5. NDC principles**

In a nutshell, the NDC is an old-age PAYG scheme based on interest-earning personal accounts where money is deposited before retirement, in the form of contributions, and withdrawn later in the form of pension annuities. Interests mature, both before and after retirement, according to a system rate chosen by the policy maker.

### 5.1. The targets

The NDC pursues the following essential targets:<sup>6</sup>

1. *Fairness*, intended as “one-to-one correspondence,” regardless of career patterns and retirement age, between lifelong withdrawals and deposits or, more precisely, as the equivalence between expected pension annuities and contributions gross of interests matured;
2. *Sustainability*, intended as equality over time between yearly pension expenditures and yearly system revenues implied by the contribution rate fixed by the policy maker;
3. *Flexibility*, intended as the free choice of the retirement age from an interval established by the policy maker.

Note that fairness implies the absence of any redistributive flows besides those from individuals who eventually live less than their life expectancy at retirement to individuals who live longer.

### 5.2. The instruments in well-behaved economies

This section identifies the instruments allowing the NDC to hit all three targets under constant longevity and employment growth.

Start with target 1. For the sake of simplicity, survivors are ignored; the analysis refers to an individual who retires on January 1, 2018, with an account balance of €100 and a life expectancy of 10 years. It is also assumed that pension annuities are awarded on January 1 each year and the system interest rate is constantly equal to 10 percent.

To show how the NDC must work after retirement to ensure fairness, start with Table 5.1. Column 3 spreads the €100 account balance over life expectancy by cutting it into 10 €10

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<sup>6</sup> The focus here is on the “undisputed” targets of the NDC scheme; Holzmann and Palmer (2012) discuss further possible benefits.

“slices,” each one devoted to a different pension annuity. In fact, the first slice is withdrawn at retirement as the first annuity, while the others mature the interests shown in column 4 until they are withdrawn. The annuities, resulting from the sum of the account balance slices and the accrued interests, are shown in column 5. For example, the fourth slice matures €3.31 in three years until it is withdrawn on January 1, 2021, as the €13.31 (=10+3.31) fourth annuity. Finally, column 6 shows the annual indexation rate (i.e., the rate at which annuities increase from each year to the following) resulting from the pension “time profile” in column 5. Note that the indexation rate is exactly equal to the system interest rate.

**Table 5.1: How NDC works after retirement for a standard pension profile**

| date     | annuity number | balance spreading | interest matured | annuities | resulting indexation |
|----------|----------------|-------------------|------------------|-----------|----------------------|
| (1)      | (2)            | (3)               | (4)              | (5)       | (6)                  |
| 1.1.2018 | 1              | 10                | ---              | 10,00     | ---                  |
| 1.1.2019 | 2              | 10                | 1,00             | 11,00     | 10%                  |
| 1.1.2020 | 3              | 10                | 2,10             | 12,10     | 10%                  |
| 1.1.2021 | 4              | 10                | 3,31             | 13,31     | 10%                  |
| 1.1.2022 | 5              | 10                | 4,64             | 14,64     | 10%                  |
| 1.1.2023 | 6              | 10                | 6,11             | 16,11     | 10%                  |
| 1.1.2024 | 7              | 10                | 7,72             | 17,72     | 10%                  |
| 1.1.2025 | 8              | 10                | 9,49             | 19,49     | 10%                  |
| 1.1.2026 | 9              | 10                | 11,44            | 21,44     | 10%                  |
| 1.1.2027 | 10             | 10                | 13,58            | 23,58     | 10%                  |
|          |                | 100               |                  |           |                      |

Actually, the balance spreading in column 3 may also contemplate decreasing (rather than constant) slices. For example, one may want each slice  $s_i$  to be 1.5 percent greater than the next, such that slices 2 through 10 can be linked to the first one as follows:

$$(I-1) \quad \frac{s_1}{(1+1.5\%)^{i-1}} \quad i = 2, 3, \dots, 10.$$

Since the sum of all slices has to exhaust the €100 account balance, the following equation must also hold:

$$\sum_{i=1}^{10} \frac{s_1}{(1+1.5\%)^{i-1}} = 100,$$

which implies that the first pension annuity ( $p_1$ ), equal to the first balance slice, is computed as follows:

$$(I-2) \quad p_1 = s_1 = \frac{100}{\sum_{i=1}^{10} (1+1.5\%)^{i-1}}$$

while further annuities are still computed by adding interests to slices (I-1). In so doing, annuities can be expressed as:

$$(I-3) \quad p_i = s_1 \cdot \left(\frac{1+10\%}{1+1.5\%}\right)^{i-1} \quad i = 2,3, \dots, 10,$$

which implies the following indexation rate:

$$(I-4) \quad \sigma = \frac{p_i}{p_{i-1}} - 1 = \frac{1+10\%}{1+1.5\%} - 1 = 8.37\%.$$

The effects of this alternate balance spreading are reported in Table 5.2.

Note how the new pension profile in Table 5.2 differs from the “standard” one in Table 5.1: the first annuities are higher whereas the last ones are lower. Thus the new profile can be referred to as “frontloaded.”

**Table 5.2: How NDC works after retirement for a frontloaded pension profile**

| date     | annuity number | balance spreading | interest matured | annuities | resulting indexation |
|----------|----------------|-------------------|------------------|-----------|----------------------|
| (1)      | (2)            | (3)               | (4)              | (5)       | (6)                  |
| 1.1.2018 | 1              | 10.68             | ---              | 10.68     | ---                  |
| 1.1.2019 | 2              | 10.53             | 1.05             | 11.58     | 0.0837               |
| 1.1.2020 | 3              | 10.37             | 2.18             | 12.55     | 0.0837               |
| 1.1.2021 | 4              | 10.22             | 3.38             | 13.60     | 0.0837               |
| 1.1.2022 | 5              | 10.07             | 4.67             | 14.74     | 0.0837               |
| 1.1.2023 | 6              | 9.92              | 6.05             | 15.97     | 0.0837               |
| 1.1.2024 | 7              | 9.77              | 7.54             | 17.31     | 0.0837               |
| 1.1.2025 | 8              | 9.63              | 9.13             | 18.76     | 0.0837               |
| 1.1.2026 | 9              | 9.48              | 10.85            | 20.33     | 0.0837               |
| 1.1.2027 | 10             | 9.34              | 12.69            | 22.03     | 0.0837               |
|          |                | 100               |                  |           |                      |

(I-2) can be generalized as follows:

$$(I-5) \quad p_1 = \frac{B}{\sum_{i=1}^n (1+\delta)^{1-i}},$$

where  $B$  denotes the personal account balance at retirement,  $n$  life expectancy, and  $\delta$  the “frontloading rate” established by the policy maker. The denominator of equation (I-5) is called the balance “divisor,” which increases with life expectancy and decreases with the frontloading rate.

On the other hand, “indexing rule” (I-4) can be generalized as follows:

$$(I-6) \quad \sigma_t = \frac{1+\pi_t}{1+\delta} - 1,$$

where  $\pi_t$  denotes the value that the system interest rate takes in year  $t$ .

Note that the choice described in Table 5.1 implies that the divisor equals life expectancy at retirement, while the indexation rate (I-6) equals the system interest rate. Note also that the policy maker can generate more frontloaded pension profiles by raising the value of  $\delta$ , thus increasing the generosity of the computing rule (I-5). Nevertheless, one should resist such a temptation since the indexation rate (I-6) would risk becoming negative in real, or even nominal, terms. Moreover, “vintage pensions” would emerge; i.e., the average level of pensions started in a distant year would become much lower than that of pensions started in a recent year.

The phenomenon can cause social envy, a harbinger of expensive equalization that would further compromise both fairness and sustainability.

Both Italy and Sweden have chosen too high values for  $\delta$  (1.5 percent and 1.6 percent, respectively). In this regard, the recent Norwegian choice of a 0.75 percent frontloading rate, inspired by the Swedish 2010 and 2011 negative indexations, went in the right direction (Christensen et al. 2012).

In view of the above, it can be concluded that reaching NDC target 1 is ensured by the following:

- *Instrument 1*: The first annuity is computed by formula (I-5), i.e., by dividing the account balance at retirement by a divisor depending on life expectancy and a frontloading rate, possibly null, established by the policy maker;
- *Instrument 2*: The following annuities increase according to the rate (I-6), which is obtained by subtracting the frontloading rate from the system interest rate.

Instruments 1 and 2 are also necessary for target 2. Nevertheless, they are not sufficient. In fact, it is evident that sustainability cannot be independent from the system interest rate, influencing both the account balances matured at retirement, hence new pensions according to formula (I-5), and the indexation rate of already existing pensions according to formula (I-6). It has been proven (Valdés-Prieto 2000; Gronchi and Nisticò 2006, 2008) that target 2 is fulfilled by adding the following:

- *Instrument 3*: The system interest rate credited to personal accounts, both before and after retirement, equals the growth rate of the wage bill.<sup>7</sup>

As for target 3, it was shown that the NDC computes the first pension annuity according to formula (I-5); i.e., by dividing the account balance at retirement by a divisor increasing with life expectancy  $n$ , which in turn decreases as retirement age increases. Therefore, workers who choose to retire at younger ages with a higher divisor “pay” their longer benefits in terms of smaller annuities. Nevertheless, the policy maker has to define an interval of retirement ages since some physiological upper limit must exist (above which employers can impose retirement on their employees) while a lower one is also advisable because too young

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<sup>7</sup> Gronchi and Nisticò (2008) proved that constant longevity and constant employment growth rate (as assumed in the present section) are the only conditions under which instrument 3 can produce annual pension expenditures equal to the corresponding contribution revenues. In fact, NDC indexing rule (I-6) allows one to abandon Samuelson’s (1958) and Aaron’s (1966) further assumption that wages also (not only employment) grow at a constant rate.

retirement ages, implying low pensions, increase the risk of poverty among the elderly. All this can be achieved by adding the following:

- *Instrument 4*: The policy maker sets an interval of admitted retirement ages and announces the corresponding divisors.

### 5.3. Reality is not well-behaved

Instruments 1–4 can be fully effective for the specified NDC targets in well-behaved economies; i.e., under the assumption that longevity is constant over time and employment grows steadily. Unfortunately, this is not the case in the real world, where longevity is rising sharply and employment growth shows irregular rather than cyclical patterns.

Cyclical changes in the employment growth rate do not prevent long-run sustainability, though they can produce temporary unbalances, which are positive (surpluses) when the employment growth rate increases and negative (deficits) when it decreases. This is why a capable enough buffer fund becomes a fundamental complement of instrument 2. An additional problem implied by nonsteady employment growth is that the system interest rate during expansions is higher than during recessions. This may cause disparities both between and within cohorts. To stabilize the rate, the Swedish NDC scheme chose not to distribute the volatile “employment dividend” and to anchor the system interest rate to the more stable wage growth. Long-run sustainability is improved by temporary adjustments of the system interest rate through the automatic balance mechanism (Settergren 2003; Settergren and Mikula 2006).<sup>8</sup>

Increasing longevity, meaning that individuals born in a given year live longer than those born in previous ones, calls for divisors increasing by year of birth (i.e., by cohort). In particular, divisors (different by retirement age) should be assigned to a cohort when it reaches the lower

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<sup>8</sup> Note that the balance mechanism reintroduces volatility to the system interest rate and, hence, disparities. However, the NDC disparities are negligible when compared with the structural ones generated by earnings-related schemes or even by the “point” schemes of the French and German type, as shown by Nisticò and Bevilacqua (2013, 2018) and Gurtovaya and Nisticò (2018a, 2018b).

bound of the age interval required by instrument 4. Moreover, they should be based on the cohort's specific residual lives at ages included in the interval. Unfortunately, such data can only be ascertained after the cohort has expired and, therefore, they have to be "estimated" at the time when it starts retiring. Two choices exist.

The first one is to derive a cohort's residual lives from mortality tables specifically projected for the cohort itself. Under "perfect foresight," this choice would produce exact forward-looking divisors, ensuring perfect fairness. The second choice is to admit that perfect foresight is a chimera and simply derive cohort residual lives from the most updated usual period mortality tables, based on the observation of previous cohorts. This second choice produces obsolete, backward-looking divisors that are lower than they should be.<sup>9</sup>

Divisors' obsolescence does not allow instruments 1–3 to fully reach targets 1–2 (fairness and sustainability). In fact, money withdrawn from personal accounts tends to exceed money previously deposited plus interest matured, while yearly pension expenditures tend to exceed corresponding contribution revenues. Note that perfect foresight does not prevent forward-looking divisors from producing imbalances. In fact, it has been proven that they produce "hypersustainability," i.e., each year pension expenditures tend to be lower than contribution revenues (Gismondi and Gronchi 2008).

Moreover, the lack of perfect foresight makes forward-looking divisors scarcely viable from a sociopolitical point of view. In fact, workers should accept to have their pensions computed on the basis of possibly wrong forecasted mortality tables<sup>10</sup> Therefore, backward-looking divisors appear to be inevitable.

To minimize obsolescence (hence to improve both fairness and sustainability), instruments 1–3 should be complemented with two recommendations. First, mortality tables should be

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<sup>9</sup> For an assessment of the potential imbalances deriving from the use of period rather than cohort life tables, see Ayuso, Bravo, and Holzmann (2018). Palmer and Zhao de Gosson de Varennes (2018, 2019) provide a detailed account of how even cohort life tables tend to underestimate life expectancy.

<sup>10</sup> For a discussion of how forecasting models tend to underestimate longevity, see Alho, Bravo, and Palmer (2013).

updated in (almost) “real time.” For example, the 2017 tables should be used in 2018 for computing divisors to be assigned to the cohort starting retirement in 2019. Second, the minimum retirement age should be as high as possible. In fact, obsolescence increases when retirement age decreases. In other words, younger coefficients are more obsolete than older ones.<sup>11</sup>

## 6. Shortcomings of the Italian NDC scheme

This section contrasts the Italian NDC scheme with the required instruments discussed in section 5.2. It starts with the indexation rule, which is quite different from (I-6).

### 6.1. Pension indexation

Computing rule (I-5) and indexation rule (I-6) are both fundamental since they “collaborate” in view of fairness (target 1), which is in turn a necessary condition for sustainability (target 2). Nonetheless, the Italian scheme applies the former but neglects the latter. In particular, it assumes 1.5 percent as the frontloading rate ( $\delta$ ) included in (I-5), while pensions are indexed to prices according to an elasticity that starts from unity for low-level pensions and decreases as pension level increases.

Such indexation rule implies crediting to all account balances after retirement a rate of interest different from the system rate, which produces severe implications against both fairness and sustainability.

Fixing the problem, and hence involving in the indexation rule both the system interest rate and the frontloading rate, should be the occasion to lower the latter in line with the abovementioned good practice started in Norway. In fact, the 1.5 percent frontloading rate would have implied negative indexation in the last 10 years.

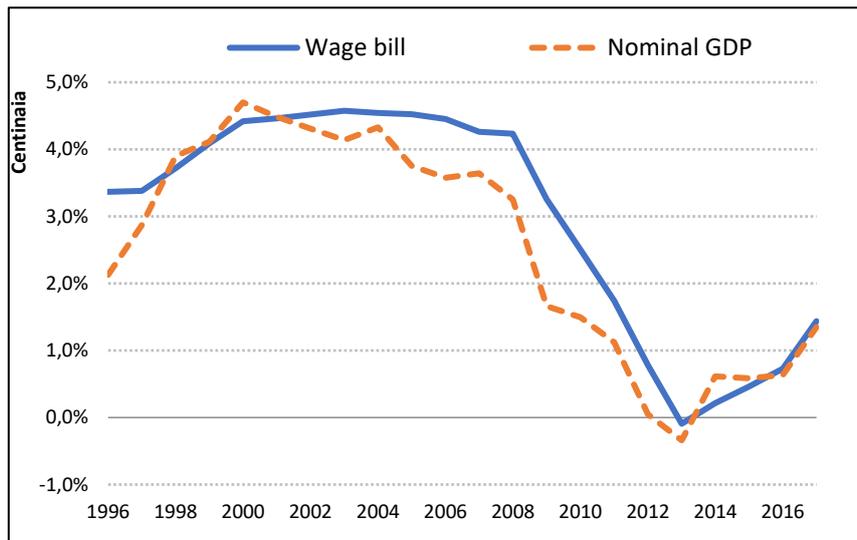
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<sup>11</sup> The problems connected with increasing longevity could be radically avoided with lump-sum payments of the entire account balance at retirement. More generally, it has been proven that both fairness and sustainability can improve by raising the frontloading rate (Gismondi and Gronchi 2008). Nevertheless, adopting such a measure should not be taken into consideration, given its negative impact on pension indexation (see section 6.1).

### 6.2. System interest rate

The Italian NDC scheme identifies the system interest rate as the growth of GDP, including profits and rents, rather than of the wage bill according to instrument 3 for target 2. Figure 6.1 shows that one should not take the similarity between the two rates for granted.

**Figure 6.1: Italy’s wage bill versus GDP growth rate, 1996–2016**



Source: Italian National Institute of Statistics (ISTAT).

The circumstance that, as of 2002, the “mistake” implied crediting to all account balances an occasionally lower interest rate cannot be a good argument, since sustainability (target 2) has to be ensured in the long run.

### 6.3. Divisors

As discussed in section 5.3, increasing longevity calls for divisors to be assigned, once and for all, to cohorts when they reach the minimum retirement age. The Swedish NDC scheme does exactly this.

Unfortunately, the Italian protocol is quite different. Starting from January 1, 2019, divisors will be updated every two years (so far, every three) on the basis of the last available (most updated) standard period mortality tables, and applied to whomever retires within the

following biennium, regardless of the year of birth. In this respect, the Italian divisors are of the conceptually wrong *erga omnes*<sup>12</sup> type.

Such a protocol produces disparities both between and within cohorts. On the one hand, it assigns different mortality rates to members of the same cohort who retire in different biennia. For example, the mortality rates imputed to Mr. White born in 1970 who retires in 2036–2037 at 66–67 will be lower than those imputed to Mr. Brown born in the same year, who will retire in 2029–2030 at 59–60. On the other hand, the same mortality rates are imputed to members of different cohorts who retire in the same biennium. For example, the mortality rates imputed to Mr. Green born in 1963 who retires in 2029–2030 at 66–67 will be the same as those imputed to the already mentioned Mr. Brown.

*Erga omnes* divisors produce not only unfairness but also uncertainty, which, in turn, hinders personal planning and encourages early retirement. In fact, workers refrain from taking the risk that increasing divisors frustrate the sacrifice of prolonging work to obtain a higher pension.<sup>13</sup>

#### 6.4. Retirement rules

According to the Fornero reform, as of January 1, 2019, the Italian NDC scheme will admit retirement at the age of 64, provided that contribution seniority is (at least) 20 years and the pension (at least) €1,268 per month. At the age of 67, the required pension amount drops to €679.5 per month, while 20 years seniority is still required. If these conditions (one or both) are not yet satisfied, retirement can be postponed until they are, up to the age of 71, when retirement is allowed regardless of seniority and pension amount.<sup>14</sup> Such age requirements are automatically updated according to longevity evolution. Note that automatic updating is appreciable, since it accomplishes the recommendations in section 5.3. Other countries,

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<sup>12</sup> Latin for “toward all.”

<sup>13</sup> Note that the “cohort-exclusive” divisors tend to be more obsolete than the *erga omnes* ones. Therefore, it is of paramount importance to follow the recommendations pointed out in section 5.3.

<sup>14</sup> Actually, a contribution seniority of at least five years is still required.

including Sweden, will probably have to follow suit (Chłoń-Domińczak, Franco, and Palmer 2012, 68).

Requirements other than age (seniority and pension amounts) hinder flexibility (target 3). Removal of those barriers would also avoid prolonging work to the mentioned high ages, unparalleled in the rest of the world. Also note that freedom restrictions apply to “weaker” laborers, those with lower wages and career breaks.

As already mentioned, the Fornero reform preserved the seniority pension for fully NDC (post-1995) workers; i.e., the right to retire at whatever age after a given record of contribution years. Starting from January 1, 2019, such a record will be 42 years and 3 months for women and 43 years and 3 months for men. Indeed, seniority pensions are alien to the NDC philosophy and clash with the idea of allowing flexibility within a preset age interval. They also exacerbate the problem of divisors’ obsolescence in two ways.

On one hand, seniority retirees will get a significant premium from the backward-looking divisors being more obsolete for their younger ages. In fact, taking into account that until 2006 schooling was compulsory up to the age of 15 years,<sup>15</sup> as of 2019 the youngest seniority pensions will be awarded to women at the age of around 57 (15+42) and to men at the age of around 58 (15+43).

On the other hand, seniority pensions would conflict with recommendations in section 5.3 if Italy correctly adopts “cohort-exclusive” divisors (instead of *erga omnes*). In fact, their youngest retirement age (57) would precede the lower bound of the ordinary age interval (64–67), thus forcing early divisors’ assignment.

### **6.5. Disability and survivors’ pensions**

Discussion of the last drawbacks of the Italian NDC requires two premises. The first is concerned with the NDC being an exclusively old-age scheme. In other words, it is not

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<sup>15</sup> As of 2006, schooling is compulsory up to 16 years.

compatible with the strong heritage of PAYG systems charging a unique contribution rate and awarding both old-age and disability pensions. In fact, such a unique rate should be credited to old-age personal accounts only partially. In so doing, the credited part would be able to finance old-age expenditures, while the rest could finance disability. Nevertheless, the contribution rate would be unique only nominally, in practice being the sum of the two. For the sake of transparency, it is preferable to split the system into different plans and let disability be financed through a different contribution rate. As an alternative, the disability plan could be “fiscalized” (i.e., financed from general tax revenues) and disability allowances, possibly means-tested, awarded to citizens independent of their being workers. Following the Swedish model, such a plan should be charged to pay contributions on allowances (as if they were salaries) to the old-age plan. Contributions, in part paid also by the disabled, would be credited to old-age personal accounts and contribute to old-age pensions.

The second premise is concerned with survivors’ benefits, which in principle can be included in the old-age NDC plan by increasing divisors to take into account the further annuities that are expected on the basis of survivors’ ages. However, redistributive flows from single to married retirees and from similar-age to distant-age couples would take place, with negative effects on fairness (target 1). As an alternative, one could admit the choice between “one-head” divisors and “two-heads” divisors, the latter ones based on survivors’ ages. Despite its compliance with target 1, such a choice would put at risk sustainability (target 2), because of both moral hazard problems and the relevant database needed for correctly computing two-heads divisors (Gronchi and Nisticò 2006). Following the Swedish model, a fiscalized survivors’ program in charge of paying means-tested, and possibly temporary, allowances would avoid all such difficulties.

Italy’s 1995 NDC reform failed to separate disability from old-age, while the 33 percent OASDI contribution rate is fully credited to old-age personal accounts. Thus old-age pension expenditures will tend to absorb the whole OASDI contribution revenues (actually more than that because of increasing longevity) and disability expenditure will therefore produce chronic deficits.

As for survivors, the 1995 NDC reform preserved the tradition of conceiving their benefits as a 60 percent continuation of old-age pensions. Sustainability (target 2) is safeguarded by computing divisors to consider the further annuities due to survivors according to their expected life and the probabilities that they will actually survive retirees.<sup>16</sup>

This paper's authors have repeatedly recommended that survivors' pensions should be transformed into allowances to be awarded by a separate fiscalized plan. The Italian political debate often discusses the hypothesis of thinning the wedge between wages and labor cost by shifting onto general tax revenues a portion of the contribution rate. Reforming survivors' benefits would allow Italy to reach such an aim while preserving fairness. Moreover, the same contribution rate would allow for more generous old-age pensions, or lower rates would allow the same pension levels. Also note that survivors' pensions, conceived as automatic continuations of old-age ones, tend to encourage Italian women not to participate in the labor market.<sup>17</sup>

## 7. Conclusions

Regardless of the form assumed by the PAYG system, the ongoing Italian demo-economic scenario will not allow future pensions to be as generous as in the past. A well-designed NDC scheme would have the merit of asking for the necessary sacrifices in a timely, fair, and transparent manner. However, it is common opinion that the NDC scheme itself is to blame for such sacrifices. Therefore, discussions are now widespread about whether it should be preserved as it is.

Proposals range from a guarantee to a basic pension to be financed by general tax revenues. Going back to the pre-Fornero low retirement ages is also on the agenda of the new Italian

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<sup>16</sup> Survivors' benefits are subject to moderate means testing, which is roughly taken into account in computing divisors. This implies further redistributive flows (besides those from single to married retirees and from similar-age to distant-age couples), conflicting with fairness.

<sup>17</sup> Despite the overall trend in gender gap reduction of its labor force participation rates, Italy has the lowest women's participation rate in Europe (World Bank 2017). For a comprehensive review of the problems connected with survivors' benefits and work incentives for women, see James (2013).

government. The proposers neglect to specify whether these proposals are compatible with the mentioned scenario and the outstanding public debt.

None of the fundamental shortcomings discussed in section 6 are on Italy's political agenda, as if Italian politicians are ignoring their fundamental importance. Thus Italy would benefit from a general debate concerning the NDC philosophy and how it should be implemented into coherent legislation. Sweden did precisely this in the four years preceding its meticulous 1998 reform (Könberg, Palmer, and Sunden 2006). Such a debate would allow understanding how a new reform could amend the 1995 mistakes and gaps such that Italy joins Sweden in being proud of its NDC scheme.

On the other hand, this paper recognizes that within the permanently unstable Italian political landscape precluding any long-term project, the poorly designed Italian pension system could at best remain as is, thus lending support to Tinbergen's premonition that "personal or institutional inertia and the tendency to maintain the existent ... often impede the execution of a rational policy" (Tinbergen 1952, 76).

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