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# Benefit-Cost Analysis of Turkish Social Insurance Institute Gradual Privatization Proposal<sup>1</sup>

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## Abstract

There has been consideration of alternative social security financing methods throughout the world during the last two decades. One alternative adopted in several countries is the privatization of so-called pay-as-you-go financing systems. The purpose of this study is to estimate social benefits and social costs associated with a Feldsteinian-type gradual privatization of the Turkish Social Insurance Institute, “SSK”. Based heavily upon data provided by the International Labor Organization, financial projections of the institution were made and extended to apply benefit-cost models of privatization. Present values of the change in net social benefit were estimated. The effect of privatization on representative individuals has been quantified. Sensitivity analyses were conducted to determine the robustness of the estimates. Benefit-cost results indicate that social benefits associated with a privatization alternative exceed the social costs even after adjustments for changes in key parameters that reduce social net benefits. However, privatization affects current representative individuals so negatively that it may constitute a “good political reason” to be against, rather than in favor of, choosing privatization.

**Keywords:** Social security, Social security privatization, Benefit-cost privatization of social security, The Social Insurance Institute, SSK.

**JEL Classification:** H5, H55

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## 1. Introduction<sup>2</sup>

Turkish social security system has been facing serious financial bottleneck since the early 1990s due mainly to a low minimum retirement age, generous benefits relative to contributions, frequent political interventions, low contribution collection rates, and other factors that have made the system financially unsustainable.

In order to achieve greater long-run sustainability, Turkey recently adopted a new social security law in 1999 toward reforming its relatively young defined-benefit pay-as-you-go social security system that based mostly on a special report done by the International Labor Office.<sup>3</sup> With this new Law, the Turkish social security system has been restructured, but a pay-as-you-go financing method has been retained. Given that ILO outlined a privatization option for the Turkish social security system in its report and Turkey chose the restructured pay-as-you-go option, one can question whether this was a rational choice from social point of view. Would Turkey be better off with the gradual privatization alternative instead? This paper is designed to answer this question. To do so, we estimate and evaluate the social benefits and costs of changing from the current Turkish Social Insurance Institute, “SSK,” to a counterfactual privatization reform alternative.

There are mainly three institutions that constitute the Turkish social security system:<sup>4</sup> “The Social Insurance Institute” (hereafter “SSK”),<sup>5</sup> “The State Employees’ Pension Fund”

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<sup>2</sup> This paper is derived from my doctoral dissertation titled “Benefit-Cost Analysis of Turkish Social Security Reform Proposals” which covered the three Turkish social security institutions. The Social Insurance Institute (SSK) is subject of this study while the other two will be published separately.

<sup>3</sup> See ILO (1996a).

<sup>4</sup> There are other organizations that provide social security to their members; however, they are not included in this study because they are small in terms of covered population along with lack of data. Among these are the Armed Forces Mutual Assistance Fund (OYAK), Special Institution for Personnel of Banks, Private Insurance Companies and Stock Exchanges, Ereğli Miners’ Pension Fund, and Primary School Teachers’ Sickness and Provident Fund.

<sup>5</sup> SSK was established to provide social protection for wage earners in 1945. It was reorganized in 1964 to increase its capacity. Persons covered by this institution are those employed by one or more employers on a contract basis. It covers approximately 38 percent of the total population (Cavusoglu, 1998).

hereafter “ES”),<sup>6</sup> and “The Social Security Institute for Self-Employed Persons” (hereafter “BK”).

To evaluate the financial strength of an institution, or all together as a system, one simply has to look at how much income the system generates (payroll taxes or contributions that contributors pay to the system), how much the system spends (in benefits and other expenses), the difference between these two figures, and how these figures change over the years as the number of contributors and/or beneficiaries change. There are some other parameters that need to be taken into account such as the benefit formulas, magnitude of the contribution rates, retirement entitlements, the population structure, and the growth rates of wages and GDP, and future interest rates and price levels. Considering these, it appeared by the mid 1990’s that the Turkish social security system was able to pay only less than full current benefits and projections for the future find that the system is unlikely to meet all future obligations by its own sources due to a low retirement age (Cavusoglu, 1998; TUSIAD, 1997; ILO, 1996a, 1996b; Sayan and Kiraci 2001a, 953), a low contribution collection rate (TUSIAD, 1996; ILO, 1996a), a low contribution base (TUSIAD, 1997), a low number of contributors<sup>7</sup> (TUSIAD, 1997), a high number of retirees (Ercan and Gokce, 1998), and a high level of benefits relative to costs (Fisunoglu, 1998; Sayan and Teksoz, 2001, 2). The structure of the system was so generous that even a 35 year-old person could retire under certain conditions (TUSIAD, 1997). Also, according to the TUSIAD study, it has been calculated that an insuree of SSK, after retiring, could receive his/her total contributions from the system within 2.5 years in the form of benefits (TUSIAD, 1997). All these factors indicated that the system could not survive unless appropriate measures were taken.

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<sup>6</sup> ES was established in 1949 as a part of the Ministry of Finance to provide social security to all civil servants employed by the central government, local governments, state economic enterprises and army members. It covers nearly 15 percent of the total population (Cavusoglu, 1998).

<sup>7</sup> It is about half of the current labor force. See TUSIAD (1997) for details.

Table 1 presents information about number of contributors (active persons) and pensioners (passive persons) from 1965 to 1999 for SSK institution. It shows how the pension system has changed in terms of its members. As can be seen in the table, the growth rate of the number of pensioners has been greater than the growth of the active members.

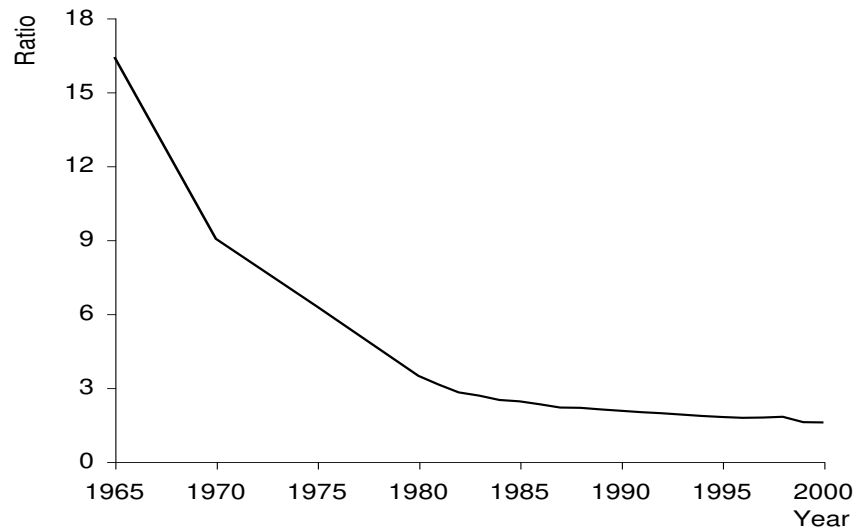
**Table 1:** Number of Active and Passive Persons by Year (000)

Year	Active	Passive	Year	Active	Passive
1965	896	55	1993	3793	1999
1970	1314	145	1994	4010	2175
1975	1823	290	1995	4209	2338
1980	2205	636	1996	4484	2540
1985	2608	1071	1997	4862	2732
1990	3287	1597	1998	5323	2931
1991	3432	1717	1999	5031	3149
1992	3622	1852	2000	5283	3340

**Source:** Turkish State Planning Organization, Economic and Social Indicators, Part VII, Developments in Social Sectors: Table 8-4. (<http://www.dpt.gov.tr/dptweb/esg/esg-i.html>).  
 Note: Active voluntary insured and active insured in agriculture are not included in the table.

Thus, the active/passive ratios have been declining over the years, and current ratios are now below 2, as figure 1 shows.

The reason for this decline was not due to the demographic changes experienced in most developed countries. It was rather, political choices that obligated the system to pay benefits to individuals who, in actuality, either did not pay contribution or paid very little.



**Figure1:** Active/Passive Ratio of SSK.

Turkish social security system reform studies speeded up in second half of 1990s to evaluate the system and develop reform alternatives to save the system. Reforms of the Turkish pay-as-you-go system actually started early in the 1970s due largely to demographic changes and higher benefit payments that made the system financially weak and questionable (TUSIAD 1997, 31-33). While ILO (1996a) argues that restructuring the existing Turkish pay-as-you-go system by changing existing parameters in such ways to result in increasing contributions and/or reducing benefits would be enough to restore the long run financial equilibrium of the system, others have argued for replacing the current pay-as-you-go system with a privatization institution. Between these two polar cases numerous alternatives can be proposed. In fact, TUSIAD (1997) offers new mandatory individual retirement accounts (IRA) along with the pay-as-you-go method, or a “two-tiered” system.

ILO developed four reform options for the Turkish social security system (1996a). Each of the reform options has been quantified by using long-term actuarial projection models. Among these options, the first and second are restructured pay-as-you-go and mandatory individual saving accounts options, respectively. The former represents continuity of the defined-benefit pay-as-you-go financing method. The latter represents a defined contribution method of privatization. TUSIAD (1997) developed a two-tiered system similar to ILO’s (1996a) third reform option. There have been a number of studies that have evaluated these and other proposed reform options for the Turkish social security system; however, no study has estimated and analyzed the benefits and costs of the proposed reform options. This study aims to do such an analysis for SSK component of Turkish social security system.<sup>8</sup>

Turkey initiated social security reform in 1999 by restructuring the current pay-as-you-go financing system as recommended by ILO (1996a). One of the interesting but real facts is that the system is projected to remain in deficit until the year 2050 even with the reform alternatives. However, the size of the deficit is projected to be smaller than in the absence of reform. Still, it is

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<sup>8</sup> ES and BK components would be published separately.

clear that the 1999 reforms did not go far enough. This raises the question of whether further reform, such as privatization, is desirable. This depends, from a social perspective, on whether the social net benefits from privatization are positive.

This study uses benefit-cost analysis to evaluate the Turkish SSK under two financing methods, one (pay-as-you-go) that has long been used in most countries and another (privatization) that has recently been adopted by many Latin American countries and received much attention worldwide. Little attention has been given so far to the social costs and benefits of both methods. In fact, there has not been even a single benefit-cost study to evaluate privatization as a Turkish social security option. This study aims to fill this gap for SSK.

## **2. Assumptions<sup>9</sup>**

In this study, we have developed two alternative social security systems for SSK. The first alternative is the current restructured Turkish SSK based on a pay-as-you-go underfunded method. The second alternative, the counterfactual, is a two-tier system, combining pay-as-you-go with a defined contribution method based on individual savings accounts. In this alternative, we assume a Feldsteinian-type privatization model that provides for a gradual privatization of the current system. Under the privatization option, benefits will be paid and taxes will be collected out of two systems for the length of the period. Current workers as well as new workers will pay social security plus privatization taxes. While pay-as-you-go based taxes will be completely used to pay pay-as-you-go benefits, privatization taxes will be used to pay benefits and administrative costs under the privatization alternative and any excess taxes will be invested.

To keep a common element between the two alternatives, benefits are held the same under both alternatives. In this way, the change in financing method and tax revenue will be the sole source of benefits and costs. Thus, we assume that the current restructured system benefits will not be different under privatization and that the tax base will be the same regardless of the system for the length of the period, which is from year 2000 to 2050. The length of the period

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<sup>9</sup> Please see Gumus (2001) for details.

seems short for examining multiple generations; however, secondary data were not available beyond 2050, and the generation of data beyond 2050 raises difficult estimation problems.<sup>10</sup>

In this study, ILO's (1995b) data were used. Actual contribution rates (sum of employer and employee) are assumed to be at their statutory levels (21.5 percent) for both reform options.<sup>11</sup> We also use required, or effective, social security tax and privatization tax rates. We will explain each of them where appropriate.

One vital assumption of the privatization option is the assumed real rate of return on investment. It is assumed that excess privatization tax revenue will be invested, and that a 9 percent real rate of return will be earned for each year in the length of the period.<sup>12</sup> In sensitivity analysis we alter this rate.

### **3. Review of the Literature**

There are a significant number of studies that investigate the Turkish social security system, explain several reasons why the system has been in financial crisis, and offer ways to reform it. There are studies that evaluate the 1999 reform and offer additional reform avenues (see for example Sayan and Kiraci, 2001a and 2001b; TUSIAD, 1997; ILO, 1996a; Ercan and Gokce, 1998). Akalin (1999) explained immediately after the new Law of 1999 that social security in Turkey is legally structured as a natural government monopoly so that it does not compete with the private sector, and, therefore, that economic inefficiency prevails. The only way that the system may be efficient in providing its services and in using its resources efficiently is to design the system in such a way that an invisible hand can operate (Akalin, 1999). Centel (1997) states that the three Turkish social security institutions should be united under one organization

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<sup>10</sup> It is possible to generate data for another 50 years or so but new projections on different variables may not be consistent with the ILO's secondary data. If longer period beyond year 2050 needs to be extended, the data should be generated by the same method for the whole period. We leave this extension as a subject of further research.

<sup>11</sup> A social security contribution rate in this study reflects the sum of employee and employer portions.

<sup>12</sup> TUSIAD (1997) used 9 percent real rate of return in its study, and we choose this rate as a maximum attainable rate in such a dynamic middle developing country where daily political agenda easily affects the directions of the main economic indicators. Thus, the real return can vary overtime, but on average 9 percent may be a good approximation.



and that it should be given financial and administrative autonomy. Many scholars do not agree with the idea of unifying the three institutions (see for instance Akalin, 1999; Tuncay, 1998).

The emphasis in the Turkish literature is given to the administrative aspect of the institutions. Whether autonomy or privatization would solve the system's long-run funding problem has been the subject of debate (Aydin 1998; Centel 1997). Those who advocate having autonomy argue that daily political interventions are the main cause of the prospective crisis, and preventing political influence on the institutions by granting autonomy to the social security institutions might help solve the problem (Akalin, 1999; Tuncay, 2000; Alper, 1999).

As the number of studies on pay-as-you-go defined benefit social security systems has increased in the last two decades, much more attention has been given to identifying the weaknesses of the Turkish systems so that new policies can be developed accordingly. Sayan and Kiraci (2001b) have in fact studied the Turkish social security system in this context. They have identified Turkish social security system parameters to optimize the system. More specifically, they developed a rather simple optimization model in an intertemporal generational accounting setting. They used contribution rates, replacement rates and minimum retirement ages as their policy options. They found that if contribution rates and replacement rates are to be held at their current values, the minimum retirement age has to be increased significantly (92).

The pay-as-you-go financing method has been applied and experienced financial crises in many countries and many of these countries have already begun to search for new methods that might be better than a traditional pay-as-you-go system (Bovenberg ve Sorensen, 2003). As a result, new methods, such as privatization, have already been adopted in different parts of the world. Privatization of social security started in Chile and has spread to other countries such as Argentina, Australia, Bolivia, Mexico, Peru, Columbia, and the United Kingdom (Kotlikoff, 1996).

There are mainly two approaches that have been the subject of the social security reform studies in the literature. These approaches are: (1) to reform or restructure publicly managed

defined-benefit pay-as-you-go financing methods, and (2) to privatize, based on defined contributions. Each study on the subject demonstrates different aspects of the issue, and reaches conclusions either in favor of or against privatizing the social security system. Kotlikoff (1996) illustrates the effects of social security privatization by using the Auerbach-Kotlikoff model. He proposes a rather simple privatization model for the United States, and concludes, based on some specific assumptions and simulation results, that privatizing social security would be likely to have a positive effect in the long-run on output and living standards, with a 4.5 percent of GDP welfare gain to future generations (Kotlikoff, 1996).

There are a number of advocates that argue that solution to social security problem may be privatization. However, they claim that switching from current to a privatization social security system would be too costly. This is called a transition problem that requires higher social security tax (or impose double social security tax on current generation). The transition path from a pay-as-you-go financing system to privatization in general would be costly for every economy. Opponents of privatization argue that for the United States, the transition path would be too costly to be politically acceptable given the current benefit and cost structure of the system (Feldstein and Samwick, 1998). Feldstein and Samwick (1998) have examined the basic transition issues and described an alternative transition path for the United States' social security system. In their study, the transition plans were constrained to provide the same amount of benefits in future years as beneficiaries would receive from the current system. They have made a number of reasonable assumptions about the base case and transition path to privatizing the system, and, based on their simulation results, conclude that privatization would generate very substantial long-run benefits which would be more than 5 percent of GDP every year and the transition costs would be relatively modest (Feldstein and Samwick, 1998).

Another potential problem with privatization of social security is unrealistic expectations of high rate of return. Opponents of privatization often state that the rate of return from privatization would not be much higher than what it is under the pay-as-you-go system, given the

risky nature of the private securities. Baker (1998) criticizes privatization and argues that rates of return from privatization have been overstated and that rates of return from the current pay-as-you-go system have been underestimated. He observes that, for the United States, the current system was a good deal for the past 60 years and that it will be a good deal for the next 60 years (Baker, 1998).

Also, under privatization it is widely believed that administration costs will be much higher than under the current system (Schulz, 2000; Mitchell and Zeldes, 1996). This argument has been a powerful tool in policy debates for opponents of privatization. Although the conceptual debate continues, Mitchell (1996) has done empirical work on this particular subject. By using US and other country's private and public retirement system administrative data, she finds that administrative costs of publicly-managed social security systems differ significantly across countries and institutional settings. She states that scale of the institution matters. Even though privately-managed social security systems are likely to have higher administrative costs than their public counterparts, she concludes, quality will be much better under private systems (Mitchell, 1-2).

Instead of having only one financing system, pay-as-you-go or privatization, a combination of these two may well be preferred over either one. This is the so called multi-tiered or multi-pillar system. In fact Feldstein and Samwick (1999, 11) considered this combination for the US social security system. Under their two-tiered system, they suggest a personal retirement account (PRA) program funded initially by a 2.3 percent tax on earnings in addition to maintaining the existing social security trust fund at a level high enough to pay promised future benefits.

## 4. Financial Projections of Current Pay-As-You-Go System

### 4.1 Data and Actuarial Model

Data from ILO (1995b) are not sufficient to conduct our analysis<sup>13</sup>. The actuarial simulation model in this study is based on the following methodology.

Let  $Z$  represent the financial balance of a social security institution. Then the following equation can be written

$$Z_t = GA_t - TE_t + OY_t \quad (3.1)$$

Where  $GA$  stands for gross assets of the institution at the end of year  $t$ , consisting of the sum of prior year assets ( $PYA$ ) and total social security contribution revenue ( $TR$ ) at the end of year  $t$ . Hence,  $GA$  may be expressed as

$$GA_t = PYA_t + TR_t \quad (3.2)$$

$TE$  in equation 3.1 represents total expenditure of the institution at the end of year  $t$ . It includes benefits ( $B$ ) paid to beneficiaries and administrative costs ( $AC$ ) of the institution. This can be expressed in the following equation

$$TE_t = B_t + AC_t \quad (3.3)$$

Lastly, the term  $OY$  stands for other income of the institution such as interest earnings, and other non-contributory income. Here we assumed that the institution can earn interest income by investing net assets ( $NA$ ) which may exist if revenue is greater than spending. If there exists such net assets ( $NA$ ) in year  $t$ , they may be invested at rate  $g$  and generate income. Thus,  $OY_t$  can be represented by the following equation

$$OY_t = NA_t * g \quad (3.4)$$

There are two more expressions implicit in equations (3.1) and (3.2) that can be represented in equation form. The first one is

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<sup>13</sup> Additionally, ILO (1995b) reports its data by year up to 2005 and every 5 to 10 years thereafter. See Gumus, E (2001) for details.

$$TR_t = TB_t * t_t \quad (3.5)$$

This equation is a simple revenue expression, however, it includes two very important variables for this study. TB stands for social security tax base or insurable base as the ILO (1995b) calls it. To estimate the social security tax base for the next fifty –years or so requires a number of assumptions about primary economic variables and other related demographic and socio-economic variables. Fortunately, the ILO (1995b) has done that for Turkey so we rely on its data and we use its data in this study. The second term in equation (3.5) represents the statutory social security tax rate in year t. We use both statutory and effective tax rates. While the former does not change from year to year, the latter is assumed to change every year so as to put the institution in financial balance.

The second implicit equation mentioned above is the following:

$$NA_t = GA_t - TE_t \quad (3.6)$$

This equation gives the expression for net assets of the institution. NA is one of the sources of other income. If  $NA > 0$ , then it will be invested and a positive investment income will be earned.<sup>14</sup> We assumed the rate of return from investing in government securities (required by law) to be 3 percent for the entire period.<sup>15</sup>

Our objective in developing the simple actuarial model is to make  $Z \geq 0$  each year for entire period. We assumed Z to be equal to zero.<sup>16</sup>

#### **4.2 Current Law Financial Outlook**

It is instructive to visualize the financial projection of SSK under each option so that we can understand its financial structure and develop alternative policies. Under the current law pay-

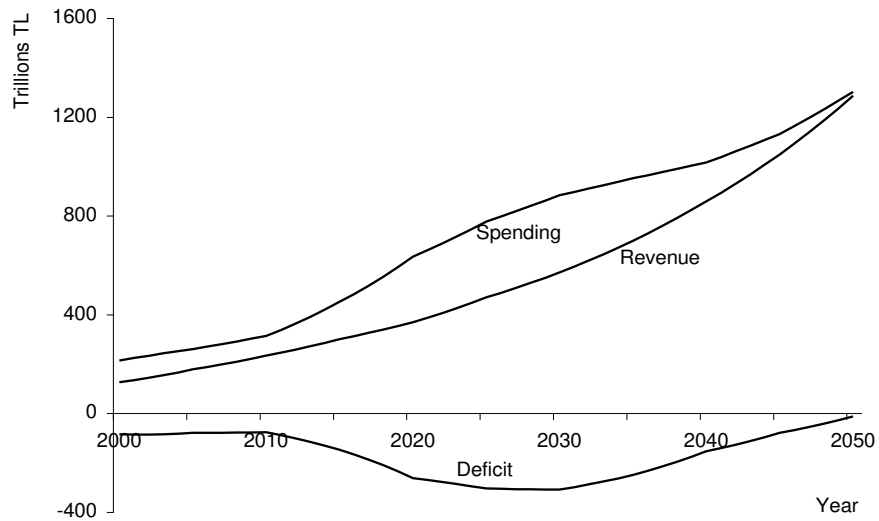
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<sup>14</sup> Feldstein and Samwick (1998) says that pay-as-you-go based social security earns, on average, a real rate of return equal to the growth rate of the economy. So we assumed this rate to be same growth rate of GDP in this study.

<sup>15</sup> If  $NA=0$ , then, revenue and expenditure of the institution in question are equal, and no difference between statutory and effective tax rate exists. If, on the other hand,  $NA < 0$ , then, there has to be income sufficient to pay the deficit. It may be obtained by borrowing. If it is, this is considered equivalent to an effective tax rate that will be increased sufficiently to eliminate deficit years in which  $NA < 0$ .

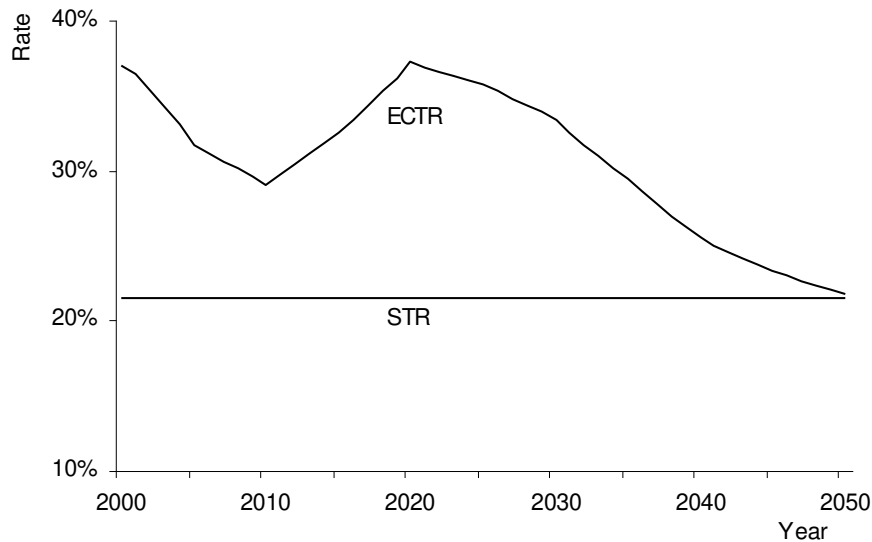
<sup>16</sup> ILO reported, using 21.5 percent of contribution rate for each institution, that the deficit of the three Turkish social security institutions would continue in the entire period no matter which option is adopted.

as-you-go financing system, SSK will not generate income sufficient to pay its obligation each year, as figure 2 clearly shows. There will not even be a single year that it would generate a surplus. A constant deficit will be maintained for the first ten years, and then the deficit keeps increasing and reaches a maximum point by year 2030. The deficit will be TL 312.8 Trillion in that year. It then gets smaller, but at the end of the projection period financial balance is yet to prevail. Even in year 2050, the deficit will be TL 16.2 Trillion.



**Figure 2:** Financial Outlook under Current Law for SSK

The SSK taxes in Figure 2 are based on the 21.5 percent rate scheduled in the current law. Taxes required to avoid a deficit would be much higher. Our calculations indicate that the effective SSK contribution rate, at which there will be no deficit, starts at 37 percent, or 72 percent higher than the statutory tax rate. These rates are shown in figure 3.



**Figure 3:** Tax rates under current law for SSK.

The effective contribution rate is the rate at which the revenue of the institution is just equal to the outlay of the institution. In other words, the statutory rate is not sufficient to provide promised benefits and the rate has to be increased to generate required revenue. Hence, the effective contribution rate is one at which current promised benefits can be provided. The 1999 policy changes have a positive effect on the effective SSK contribution rate; it keeps declining for the first ten-year period even though it starts at a high rate. However, this short run positive effect is not enough to achieve “no deficit,” and after a ten-year period the rate starts increasing and in year 2020 it peaks at 37.1 percent. After that year it steadily decreases and in year 2050 it reaches 21.8 percent, which is close to the statutory rate.

#### **4.3 Privatization Alternative**

There are two components under privatization alternative. One is a pay-as-you-go component that is maintained until the transition to privatization is completed.<sup>17</sup> The other

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<sup>17</sup> Pay-as-you-go component: The methodology is similar to the one that we just developed in the previous section. We assumed that the pay-as-you-go contribution rate would be paid by current workers as well as new entrants to the system. Benefit payments from this system will be paid to those who are already retired and to those who are eligible under current law. However, the number of eligible retirees will decline along with benefit expenditures and the opposite will be true for ISAs. Thus, the same procedure developed above will be applied for the pay-as-you-go component of privatization.

component is the individual savings accounts that are invested in private securities.<sup>18</sup> We assumed such a gradual privatization that the transition period would last for the entire projection period.

#### **4.4 Financial Projections of Privatization Alternative**

Since most of the South American countries privatized their retirement systems, other countries have been closely watching the performance of these privatized retirement systems. The privatization experience led the ILO to develop a reform option under Turkish parameters.

The privatization alternative in this study is modified from the ILO's original work in two ways. First, in order to make comparisons among the alternative reform options, ILO kept the contribution rate for the three institutions at 21.5 percent. In this study we keep benefits the same under both alternatives. More explicitly, benefit expenditures from year 2000 to 2050 will be same under both alternatives. Second, there will be no surplus in any trust funds or ISAs beyond year 2050.

#### **4.5 Financial Projections Under Privatization Alternative**

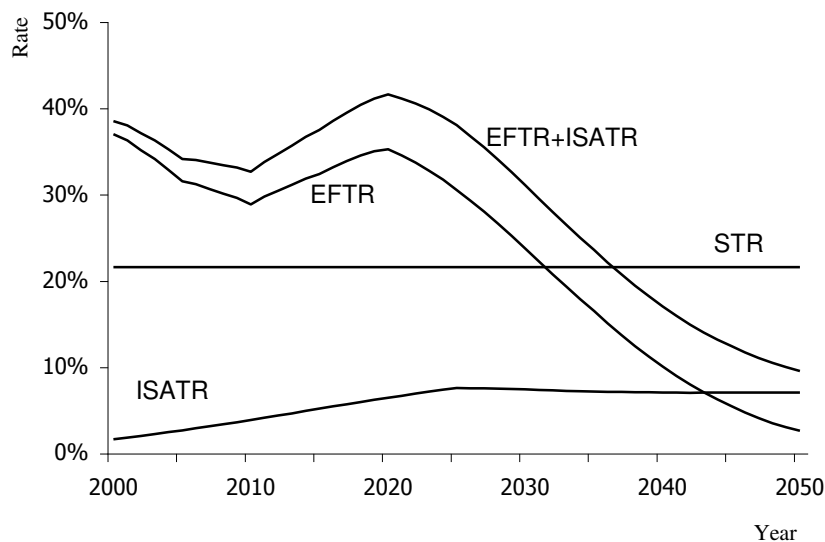
The privatization of SSK as developed in this study shows that the effective rates at the beginning of the period will be higher than the statutory contribution rates; however, they will decline as the privatization transition advances. Figure 4 shows four-contribution rates under privatization. STR is statutory contribution rate that stays constant at 21.5 percent. EFTR is the effective contribution rate for the pay-as-you-go component of the privatization option. It is the rate that current active insurees and employers will pay to the pay-as-you-go component. It starts at a rate that is 71 percent higher than the statutory tax rate. Another tax rate is the individual savings account rate (ISATR). This tax is a new tax that starts at a very low rate and increases

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<sup>18</sup> Individual Savings Accounts Component: The same methodology is also employed here with some modifications. First, there are two administrative cost components that need to be separated. One is the cost of administering the disability and survivorship component. The other is the administration cost of individual savings accounts. Under the privatized part of the system, the disability and survivorship components require separate administration. Thus, the cost for this might be much less than the administrative costs of managing ISA funds. We followed the ILO (1995b) and assumed that one half of 1 percent (0.005) of the social security tax base will be sufficient for paying the administrative costs of the disability and survivorship components. Since the ISAs are assumed to be administered by private fund managers, much higher costs of administering the ISAs may occur. We assumed that this rate would be one percent of gross assets of individual savings accounts of an institution.

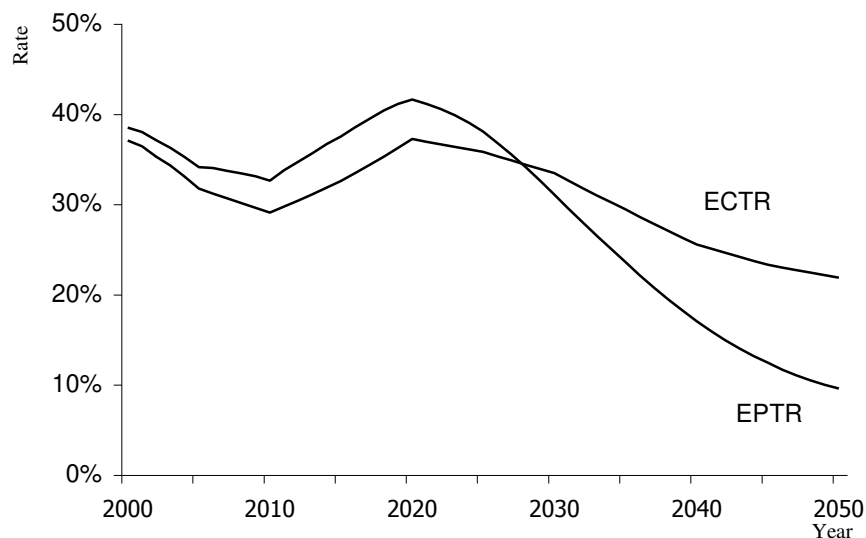


gradually. ISATR plus EFTR is the combined tax that will be collected under privatization. While revenue from the ISAs will be invested in the capital market after paying promised benefits and administrative costs and a trust fund will be accumulated, revenues from the pay-as-you-go component will be used to pay promised benefits. As figure 4 shows, the overall privatization tax rate (EFTR+ISATR=EPTR) decreases as the transition period gets underway, but then increases, and by year 2022 it reaches the highest rate of 40.45 percent. As privatization proceeds beyond 2022, the effect of built-in fund increase causes the effective rate to decline. Under privatization, in fact, the total contribution rate will be less than the statutory rate by and beyond the year 2037. By the year 2050, the rate would be 9.5 percent, or 55.8 percent lower than the statutory rate. Therefore, privatizing SSK would eventually require only 44.2 percent of the current statutory tax rate to provide the same amount of benefit.



**Figure 4:** Tax rates under privatization for SSK.

While privatization for SSK seems a better option, it is instructive to compare effective contribution rates between the current law and the privatization alternatives. Figure 5 shows both rates. ECTR is the effective current law pay-as-you-go social security tax rate, and EFTR+ISATR is the total effective tax rate that would prevail under the privatization option (EPTR). As figure 5 clearly indicates, both tax rates show similar patterns in terms of increase and decrease throughout the period. However, the rate under privatization is higher than it is under the current system at the beginning of the period up to year 2027. This is due to the transition cost of establishing the privatization trust fund. Beyond year 2027, the effective tax rate with privatization is less than the current law effective tax rate. The difference between the two rates after year 2027 is greater than the difference before the year 2027.<sup>19</sup>



**Figure 5:** Effective tax rates with (EPTR) and without (ECTR) privatization for SSK.

<sup>19</sup> The cost-benefit analysis in this study requires the use of a number of additional parameter values and data in addition to that generated from our actuarial model and data provided by ILO (1995b). Some of these come from relevant literature, and we have calculated some of them ourselves. To calculate the marginal welfare cost of taxation, we need the aggregate marginal tax rate,  $m$ , the compensated labor supply elasticity,  $\eta$ , and total labor income,  $wL_2$ . We use 30.5 percent for  $m$ , which is taken from OECD (1998, 156). The value of the labor supply elasticity is taken from Sayan and Kenc's study (1999b). As for the total labor income, there were no data projections available for the period this study covers. By using national average wage ILO (1996b) we calculated total labor income.

## **5. Benefit-Cost Analysis of Turkish SSK**

As Feldstein (1996a) explained in his paper, a social security privatization has primarily 3 impacts on the economy. The first impact has to do with the effect of taxes that government collects on the labor supply. The second impact of privatization is on the nation's capital stock. More specifically, privatization will allow some of the taxes used to finance social security to be invested in the stock market. The real rate of return on these investments is expected to be higher than the real rate of return on government securities. Thus, it will help to increase the nation's capital stock. This is especially important for developing economies.

Because of privatization, there would be also a change in government saving. The change in government saving will have an impact on capital accumulation through its effect on crowding-out or crowding-in of private investment.

The last impact would be the change in the costs of administering the system. It is widely believed that the administration cost of social security under privatization would be much higher than it is under the current pay-as-you-go financing method.

These impacts are the sources of the social benefits and social costs of privatization. We think that changes in tax rates and in national saving would generate social benefits that exceed social costs, while changes in administration costs will generate social costs. The net benefit will depend upon the difference between the values of these impacts.

### **5.1 Marginal Welfare Cost of Taxation**

Economic theory suggests that the social security payroll tax distorts the labor supply decision. Feldstein (1995, 1996a) states that the payroll tax distorts occupational choice, location, number of hours individuals work, and work effort. In this study we emphasize the effects of social security on number of hours worked and the subsequent welfare cost of taxation. We will estimate the marginal welfare cost of taxation for each year through the year 2050 using Browning's (1987) partial equilibrium model of marginal welfare costs. Browning's model is given

$$WC = \left[ \frac{m + 0.5dm}{1 - m} \right] \eta w L_2 dm \quad (1)$$

The new parameter,  $\eta$ , is the labor supply elasticity. We will calculate the marginal welfare cost using equation (1).

## 5.2 Private Saving

Changes in taxes will also affect the value of the wealth represented by the retirement system and thus potentially affect GDP. Actually, there have been many studies that investigate the relationship between private saving and pay-as-you-go- based social security system both theoretically and empirically. These studies include Barro (1974) and Feldstein (1974). While Barro (1974) argues that there is no significant adverse effect of social security on private saving, Feldstein (1974) argues and found evidence otherwise. They continued their arguments empirically. These studies include Barro (1978) and Feldstein (1978; 1996b). More recently, Meguire (1998), Attanasio and Paiella (2001), and Alessie and Kapteyn (2001) looked these issues again. They found evidence that supports Feldstein's view. Coronado (1997) for instance, studied the effects of privatization on household saving from Chilean social security privatization experience. He also found evidence that supports Feldstein's view.

In this study we follow Feldstein (1996a) view as he indicates, social security wealth (SSW) will be changed as taxes change. Social security wealth is the net present actuarial value of expected future benefits and costs. An increase in taxes reduces SSW and a reduction in taxes increases SSW. Feldstein (1974, 1996b) studied the relationship between social security and saving and concluded that social security wealth reduces private saving. Changes in private saving affect the capital stock and GDP. Specifically, an increase in private saving will have a positive effect on the capital stock and GDP.

## 5.3 Government Saving

There is another potential impact of privatization on the capital stock and GDP. This impact comes from the changes in government saving as a result of privatization. Privatization

will change the size of the government's net budget balance-the surplus or deficit. If the budget deficit shrinks (grows), government borrowing will decrease (increase), "crowding in" (out) private investment. If privatization crowds in (out) private investment, the capital stock and potential GDP will increase (decrease). Under both the existing SSK system and privatization scenario, there will be no social security surplus. There will be a change in the size of the social security deficit, however. We assume that this deficit will be financed by borrowing rather than by reductions in other government expenditures. Therefore, the costs and benefits from changes in the deficit will come from changes in private investment, rather than from changes in other government programs.

#### **5.4 Administrative Costs**

The fourth source of benefits and costs of privatization is from the changes in the cost of administering the system. It is widely believed that the privatization of social security would increase administrative costs (Schulz, 2000; Mitchell, 1996; Mitchell and Zeldes, 1996), given the higher cost of managing portfolios of private securities than the cost of managing government securities. Thus, we will estimate the changes in the cost of administering the SSK under the privatization alternative.

#### **6. The Benefit-Cost Model**

In order to estimate the changes in benefits and costs outlined in the previous section, we will use the traditional benefit-cost model that is widely used in evaluating public programs and projects. A benefit-cost analysis requires a comparison of two scenarios: one "without" the alternative being evaluated, and one "with" the alternative in place. The "without" scenario is a projection of the future with the current Turkish Social Insurance Institute, as recently reformed. The "with" scenario is a projection of the future with the privatization alternative instead of the current system. The ILO has developed the basic elements of both of these scenarios. We will use these scenarios in our analysis, supplemented by additional data, as necessary. We will examine

these scenarios carefully, however, for debatable assumptions and parameters and incorporate reasonable alternative assumptions and parameters in the sensitivity analysis.

In its simplest form, net benefit (NB) can be expressed as

$$NB = B - C \quad (4.2)$$

Where B is benefit and C is cost.

Since benefits and costs are often realized at different times they are not comparable unless they are expressed in terms of present values that can be obtained by using appropriate discounting (Gramlich, 1990). The present value of a benefit,  $B_t$ , in any future year  $t$  is  $B_t/(1+r)^t$ , where  $r$  is the discount rate. Similarly, the present value of a cost,  $C_t$ , in any future year  $t$  is  $C_t/(1+r)^t$ . The present value of the net benefit in a future year,  $t$ , can be expressed as

$$PVNB_t = \frac{B_t}{(1+r)^t} - \frac{C_t}{(1+r)^t} \quad (4.3)$$

The present value of a stream of net benefits can be expressed as

$$PVNB_{0, T} = \sum_{t=0}^T \frac{B_t}{(1+r)^t} - \sum_{t=0}^T \frac{C_t}{(1+r)^t} \quad (4.4)$$

Given the benefits and costs described above, the model can be expressed in the following way symbolically;

$$\Delta PVNB = \Delta PVB - \Delta PVC \quad (4.5)$$

Where

$$\Delta PVB = PV (-WC) + PV (GDP_g) + PV (GDP_{ssw}) \quad (4.6)$$

and

$$\Delta PVC = PV (WC) + PV (-GDP_g) + PV (-GDP_{ssw}) + PV (AC)^{20} \quad (4.7)$$

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<sup>20</sup> Where the symbols can be expressed as:  $\Delta PVNB$  = Present value of change in net benefit,  $\Delta PVB$  = Present value of change in benefit,  $\Delta PVC$  = Present value of change in cost,  $PV (-WC)$  = Present value of decrease in welfare cost of taxation,  $PV (GDP_g)$  = Present value of increase in GDP due to increase in government saving,  $PV (GDP_{ssw})$  = Present value of increase in GDP due to decrease in social security wealth,  $PV (WC)$  = Present value of increase in welfare cost of taxation,  $PV (-GDP_g)$  = Present value of decrease in GDP due to decrease in government saving,  $PV (-GDP_{ssw})$  =

It is necessary to mention that all items except administrative costs are the source of costs for some years and of benefits for other years. Hence, we will express them in “change in net present value” term.

Given the need to pay promised benefits to current retirees while simultaneously building up privatized trust funds for future retirees, an initial increase in taxes, or reduction in other government expenditures, is required. We assume the former. Thus,  $WC_t$  will be positive initially. If the rate of return on private securities exceeds the rate of return on government securities, the required trust funds can be achieved eventually with lower taxes. Thus,  $WC_t$  will eventually turn negative as the privatization alternative matures.

Privatization will initially increase the government budget deficit, or reduce government saving resulting in reduced GDP. Eventually, however, the deficit will fall and GDP will increase as a result.

Privatization will also initially decrease, and then increase, social security wealth (SSW), as a consequence of the required changes in taxes. The effect on SSW is expected to initially increase and then reduce GDP.

The Effect of privatization on administrative cost is expected to have an unambiguous effect on net benefits. That is, privatization should increase administrative costs throughout the entire study period.

In evaluating public programs, choosing the right discount rate is very important. We will use the discount rate,  $r$ , that is known the social discount rate. It differs from the market discount rate. It reflects the social rate of time preference.

The basic question is whether the present value of change in net benefit (PVdNB) is greater than zero. If it is, then privatizing the social insurance institute, “SSK”, will produce a potential Pareto improvement.

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Present value of decrease in GDP due to increase in social security wealth,  $PV(AC)$  = Present value of increase in administration cost of the system.

Given reasonable doubt about the value of certain parameters, sensitivity analysis will be performed. It will include adjustments for (1) the greater variability in returns on private securities in the case of privatization, (2) different discount rates, and (3) different estimates of labor supply elasticity.

From the individual viewpoint, the change in wealth of representative individuals will also be estimated under both alternatives. This will be done by calculating the present value of benefits and costs with and without privatization. The change in wealth of each representative individual is the difference between the change in present value of benefits and costs.

### **6.1 Benefit-Cost Results from Privatizing SSK<sup>21</sup>**

There are four benefit-cost categories that have been identified and estimated.

### **6.2 Marginal Welfare Cost of Taxation**

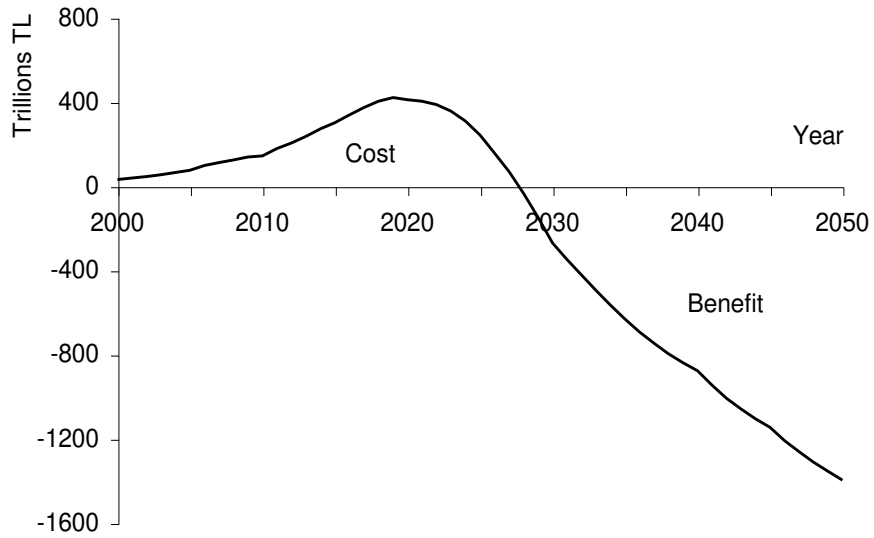
The marginal welfare cost of taxation (MWC) in this study essentially tells us that a change in social security tax rates produces costs or benefits to society depending on the direction of the change. In other words, a change in social security tax rates will alter the well-being of the society either negatively or positively.

Figure 6 shows the marginal welfare cost of taxation due to the changes in the SSK contribution rate if privatization was undertaken. The area between the curve and horizontal axis should be interpreted in the following way: the area above the horizontal axis, “the positive region,” represents costs to society while the area below the horizontal axis, “the negative region,” represents benefits to the society. This cost is TL 31 Trillion in the first year, 2000, and it increases during the transition period. It reaches a maximum in year 2019 of TL 422 Trillion. Nine years after, by year 2028, SSK starts producing benefits from lower taxes. Such benefits increase steadily and reach TL 1,396 Trillion by the year 2050. It should be noted that the costs and benefits in figure 6 are given as their level values not their present values.

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<sup>21</sup> In this section, the results of the benefit-cost analysis described in the previous section will be presented. It should be noted that the results are to be evaluated based on the assumptions of this study.

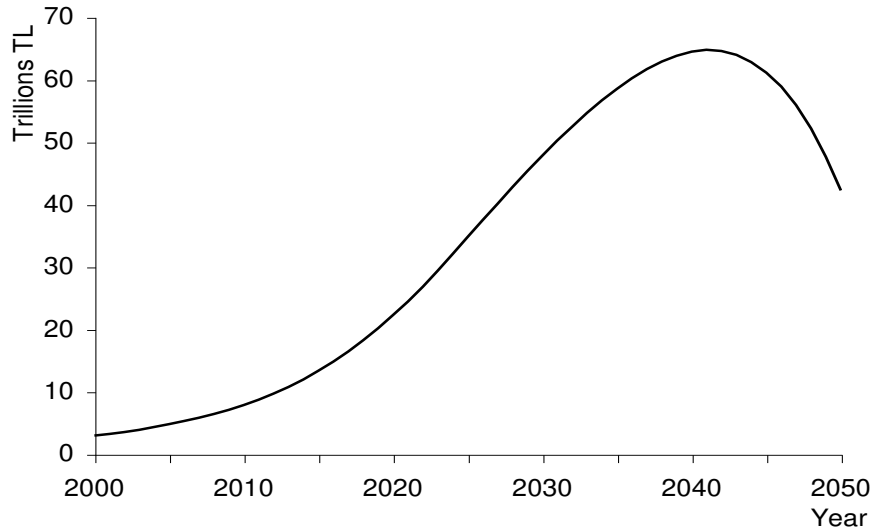




**Figure 6:** Change in the marginal welfare cost of taxation from privatizing SSK.

### 6.3 Administrative Costs

The second benefit-cost category is the change in administrative costs between the two alternatives. It is widely believed that under privatization administration costs would be much higher than they are under a pay-as-you-go financing system. Figure 7 shows the changes in administrative costs for SSK. All the area under the curve represents additional cost. It starts at TL 2.9 Trillion in 2000 and increases as the privatization transition takes place. It reaches its highest point in year 2041 at TL 64.7 Trillion. Although administrative costs start declining after the year 2041, they will not reach the level that would have been under a pay-as-you-go system.

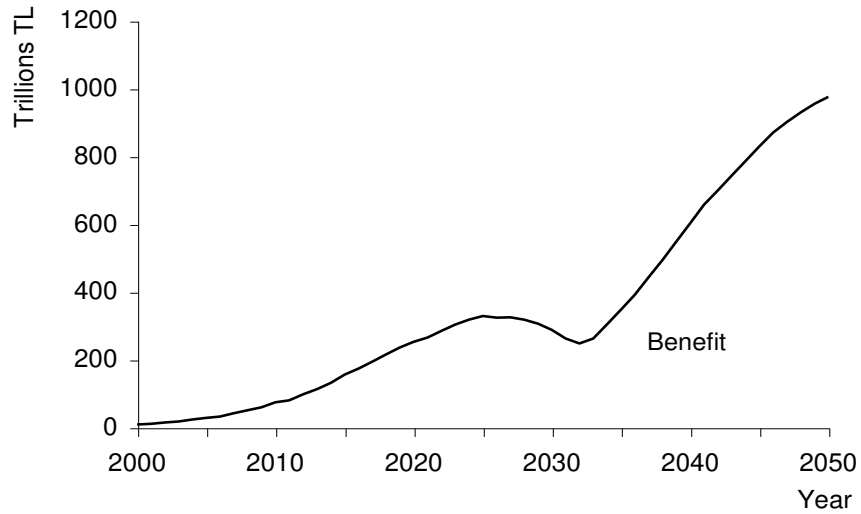


**Figure 7:** Changes in administrative costs from privatizing SSK.

#### **6.4 Government Saving**

The third benefit-cost category for SSK is the change in GDP due to changes in government saving as a result of the change in the way the SSK is financed. The social security budget is generally kept separately in Turkey. However, as in the United States, it is considered part of the government budget (consolidated) and it is, therefore, used for political purposes. While social security surpluses can be used to finance various governmental programs, the social security surpluses can be used to retire government debt; that is, they can be “saved”. Changes in “government saving” would lead to changes in investment that, in turn, change GDP.

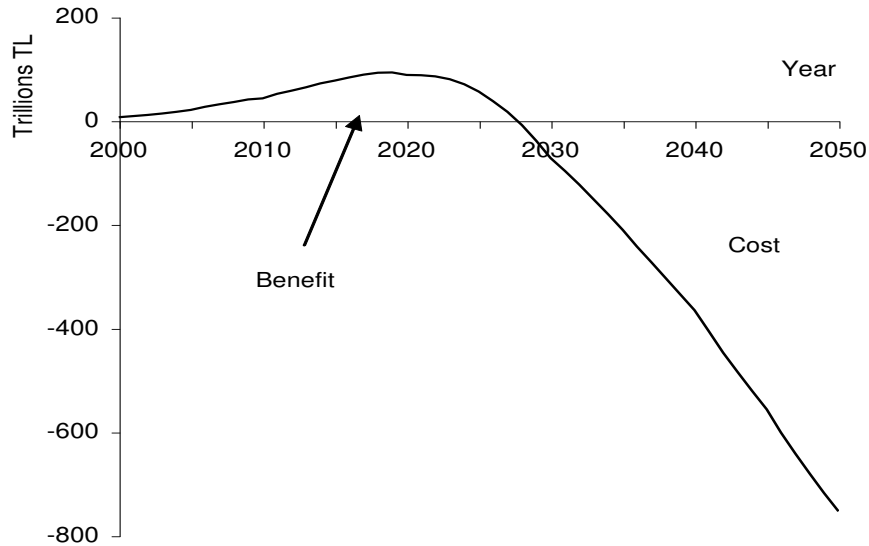
Figure 8 shows the change in GDP due to the change in government saving, given that privatization reduces SSK deficits or SSK dissaving, and assuming that the smaller SSK deficits do not simply induce the government to increase the consolidated budget deficit. The area under the curve should be interpreted as benefits. Although in the first few years the generated benefit is quite low, beyond 2010 it increases. It is surprising to note that even under the transition to privatization, there is no single year that has a negative effect due to a change in government saving behavior. The magnitude of the benefit is also important. In fact, the cumulative benefit is TL 17,328 Trillion and it is the largest undiscounted benefit item.



**Figure 8:** Change in GDP due to change in government saving from privatizing SSK.

### 6.5 Private Saving

The last benefit-cost category is the change in GDP due to the change in private saving. Figure 9 presents the changes in GDP due to changes in private saving as a result of changing the SSK financing method. Because of privatization and the increase in the effective SSK tax rates, the change in private saving affects GDP positively during the transition period. As privatization progresses, the positive effect disappears and the change in GDP becomes negative and it decreases rapidly as shown in figure 9.



**Figure 9:** Change in GDP due to change in private saving from privatizing SSK.

### 6.6 Net Benefits and Present Values of Net Benefits from Privatizing SSK

We presented the results for the four benefit-cost categories for SSK above. However, for benefit-cost analysis, it is the present values of the change in net benefit that matters. If the present value of change in net benefit is greater than zero, we can conclude that privatizing SSK would be a potential Pareto improvement. Thus, we calculated the change in net benefits and the present values of the change in net benefits for SSK. The result can be seen in figure 10. The figure summarizes all of the proceeding benefit-cost categories in terms of the change in net benefits and change in present values of net benefits. While in the first 24 years, both the change in net benefits ( $\Delta NB$ ) and present values of the change in net benefits ( $\Delta PVNB$ ) are negative, they are positive in the last 27-year period. Further, total  $\Delta PVNB$  for the entire period is greater than zero for SSK. Thus, for SSK, the social benefits of privatizing SSK would be higher than the social costs privatization brings.

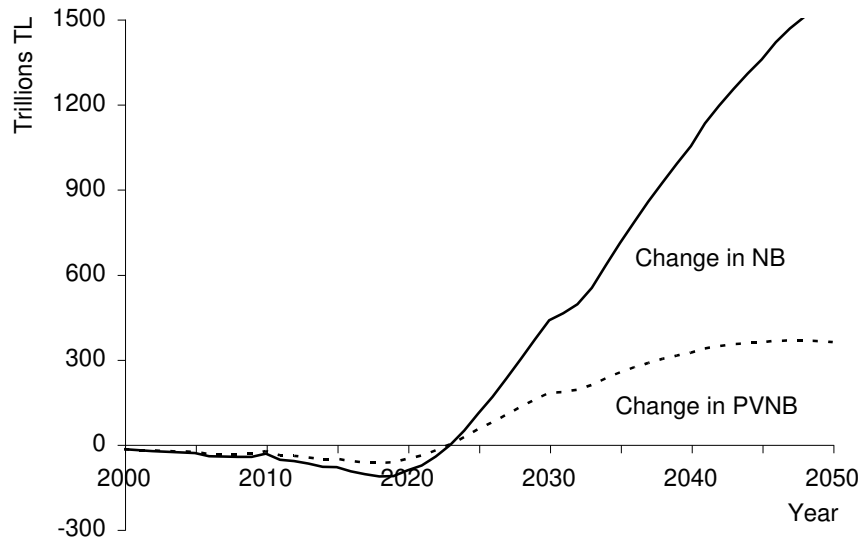


Figure 10: Change in net benefit and present values of net benefit from privatizing SSK.

### 6.7 Summary of Benefit-Cost Results

We have summarized the changes in present values of social benefits ( $\Delta PVB$ ), social costs ( $\Delta PVC$ ), and social net benefits ( $\Delta PVNB$ ) according to source, for SSK in table 2. Changes in the marginal welfare cost of taxation ( $\Delta MWC$ ) due to the changes in social security contribution rates are reported in the first column. It is apparent in the table that the changes in the social security tax rates yield both costs and benefits, in present value equivalents. The present values of social costs result from additional higher contribution rates due to privatization (first 28 years for SSK), and the present values of social benefits result from the lower contribution rates that prevail under privatization for the remaining years. The change in net social benefit ( $\Delta PVNB = \Delta PVB - \Delta PVC$ ) due to  $\Delta MWC$  is positive. It is TL 1,748 Trillion for SSK. In fact, the marginal welfare cost of taxation due to privatization yields positive present values of net social benefit that constitute 29 percent of the total present value of net benefit for SSK.

Changes in administrative costs have an unambiguous impact as expected. However, they have small impacts on the present values of net social benefit. They contribute only 10 percent of

the present value of the change in social cost for SSK. The changes in administrative costs ( $\Delta AC$ ) are presented in the second column in table 2.

The changes in GDP due to the changes in government saving are reported in the third column in table 2. The impact on the present value of net social benefits from the changes in GDP due to government saving is significantly larger than the impact of administrative costs. Changes due to government saving constitute the largest part of present value of net benefit for SSK, 50 percent. This result was expected. As privatization progresses, the deficit or borrowing requirement of government declines. This, in turn, crowds in private investment, resulting in a significant positive impact on GDP.

The net effect of the change in private saving on GDP was negative, however. As Feldstein (1996b) states, upon privatization, additional taxes (or higher social security taxes) are necessary in the transition period. This reduces public retirement wealth, leading people to consume less and save more of their income. Hence, an increase in taxes causes a higher level of private saving. After the transition, however, taxes decline, causing public retirement wealth to increase. As a result, private saving declines. By looking at the column for  $\Delta GDP_p$  in table 2, we see the same pattern. The overall effect, in present value terms, however, is negative.

Of the four benefit-cost categories,  $\Delta AC$  and  $\Delta GDP_p$  have negative net present values. In fact, the latter has greater negative present values of net benefit than the former. The present value of net benefit due to the change in administrative cost ( $\Delta AC$ ) is approximately 47 percent of the  $\Delta PVNB$  due to the change in GDP ( $\Delta GDP_p$ ) for SSK.

In terms of benefits, the largest source is the change in GDP due to change in government saving ( $\Delta GDP_g$ ).

In table 2, the last column gives the horizontal summation.  $\Delta PVB$  is TL 12,604 Trillion,  $\Delta PVC$  is 6,675 Trillion, and therefore,  $\Delta PVNB$  is TL 5,929 Trillion, or significantly greater than

zero. Thus, it has significantly positive  $\Delta PVNB$ . Therefore, based on this result, alone, privatizing the SSK produce a potential Pareto improvement for Turkey.<sup>22</sup>

**Table 2:** Summary of Benefit-Cost Results for SSK (In Trillion TL)

Type	Benefit-Cost Sources				Total
	$\Delta MWC$	$\Delta AC$	$\Delta GDPg$	$\Delta GDPp$	
$\Delta PVB$	5,441	0	6,254	909	<b>12,604</b>
$\Delta PVC$	-3,693	-660	0	-2,322	<b>-6,675</b>
$\Delta PVNB$	1,748	-660	6,254	-1,413	<b>5,929</b>

$\Delta PVB$  represents present value of change in benefit,  $\Delta PVC$  represents present value of change in cost, and  $\Delta PVNB$  represents present value of change in net benefit.

Note: Negative figures indicate costs.

## 6.8 Sensitivity Analysis

The benefit-cost results are based on a number of assumptions that were stated in section 1. In this section, we make changes in key parameters that appear to be most likely to affect  $\Delta PVNB$ , and provide estimates of the effects of these changes.

### 6.8.1 Adjustment for Discount Rate

We have used a real discount rate of 3 percent as a proxy for a high-end estimate of the social rate of time preference. For sensitivity analysis, we apply rates of 2 and 4 percent. While we expect an increase in  $\Delta PVNB$  when substituting 2 percent for 3 percent, the reverse is expected if 4 percent used instead of 3. Table 3 shows the results. It should be noted that even though the rate of decrease and increase in the real discount rate is the same ( $\pm 0.01$  or  $\pm 33.3$  percent), the changes in the results are not same. For instance, there is a 58 percent increase in  $\Delta PVNB$  for SSK as a result of the decrease in discount rate to 2 percent. When 4 percent is used instead, the decline in  $\Delta PVNB$  is only about 38 percent. Although the effect of changing the real discount rate to 4 percent causes one of the largest declines in the  $\Delta PVNB$ , the resultant  $\Delta PVNB$  is still significantly greater than zero.

<sup>22</sup> We calculated the internal rate of return (IRR) based on the data underlying table 2. It is 10.94 percent. This estimate is significantly greater than zero. Whether it is greater than the best alternative rate is unknown.

This is not a surprising result. In fact, the IRRs reported earlier indicate that  $\Delta PVNB$  will remain positive for real rates up to the range of 9-11 percent. These are well out of the range of reasonable adjustment.

### **6.8.2 Adjustment for Risk**

We have assumed and used a 9 percent real rate of return (ROR) on the balances in the privatization trust funds. Given the dynamic nature of the Turkish economy this rate may be justified. In fact, TUSIAD (1997) used this rate in its privatization study. However, this method does not account for variations in returns.

We use two methods to account for such variation. One reduces the 9 percent ROR by risk premia. The other increases the contribution rate.

Two risk premia are used: 2 percent and 4 percent. The 2 percent premium reduces the ROR to 7 percent, or about half of the 14.06 percent ROR earned on Turkish equities from 1990-1999.<sup>23</sup> The 4 percent premium reduces the ROR to approximately the level considered by Feldstein and Samwick as a certainty equivalent for a U.S. 9 percent ROR.

Table 3 summarizes sensitivity results that are obtained by the risk premium adjustments. Using a 7 percent real rate of return yields TL 3,857 Trillion of  $\Delta PVNB$  for SSK, a 35 percent reduction. While the substitution of 7 percent for the 9 percent used in the original calculations reduces the  $\Delta PVNB$  as we expected, it still has large positive  $\Delta PVNB$ .

When the 5 percent real rate of return is substituted for 9 percent, the resultant  $\Delta PVNB$  is still positive. It is TL 1,477 Trillion. The reduction from the original  $\Delta PVNB$  is 75 percent.

### **6.8.3 Adjustment for Labor Supply Elasticity**

We followed Browning's (1987) partial equilibrium model of the welfare cost of taxation. In his study, Browning gives the range of labor supply elasticity to be between 0.2 and

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<sup>23</sup> Real interest rate in the 1990s are as follows (%): 1990, 14.2, 1991, 9.1, 1992, 10.3, 1993, 16.3, 1994, 16.7, 1995, 13.2, 1996, 17.3, 1997, 2.6, 1998, 15.7, and 1999, 25.2. These rates are taken from IMF Staff Country Report No: 00/14, February 2000, page 14. See report for details.



0.4. We used a labor supply elasticity of 0.2, from Sayan and Kenc (1999), in original calculation. We changed it  $\pm 0.1$  to see how results would change, however. Using 0.3 for the labor supply elasticity, the  $\Delta PVNB$  increased by TL 874 Trillion, as shown in table 3. By substituting 0.1 for 0.2, almost exactly the same amount of change in  $\Delta PVNB$  occurred in the opposite direction.

**Table 3: Sensitivity Results: Change From Reference Level  
(In Trillion TL, Percent)**

Measure	Value	$\Delta PVNB$	$\Delta(\Delta PVNB)$	IRR	$\Delta IRR$
Reference	9%	5,929		10.94	
Risk Adj.	7%	3,857	-2,073	7.45	-3.49
Risk Adj. (2)	5%	1,477	-4,453	4.48	-6.46
Disc. Adj.	2%	9,375	3,445	11.46	0.52
Disc. Adj.	4%	3,690	-2,240	10.50	-0.44
L. Sply. Elasticity	0.3	6,804	874	8.12	-2.82
L. Sply. Elasticity	0.1	5,055	-875	52.75	41.81
Admin. Costs	2%	4,603	-1,327	8.84	-2.10

#### 6.8.4 Tax Rate Increase

In a recent article, Feldstein (1997) indicates that a 50 percent increase in the contribution rate (from 2 to 3 percent) to a U.S. privatization trust fund (coupled with the continuation of the present system during a phase-in period) would “virtually rule out the possibility –less than one chance in 1,000 – of not being able to fund”<sup>24</sup> benefits.

Assuming that such an increase for Turkey would virtually eliminate risk as well, we increased the contribution rate for SSK.

The results are presented in table 4. The original value of  $\Delta PVNB$  is reported in the first row. The middle row shows the result of the  $\Delta PVNB$  after introducing 50 percent ISA tax increase. The last row shows the change in the  $\Delta PVNB$  between the original value and value after the increase in the ISA tax rate by 50 percent. For instance, in the column  $\Delta MWC$ , the original  $\Delta PVMWC$  is TL 1,748 Trillion. After the ISA tax rate is increased by 50 percent,  $\Delta PVMWC$

<sup>24</sup> Feldstein (1997, p. 38)

becomes negative, TL -3,912 Trillion. The total effect of the increase in the tax rate is to reduce  $\Delta$ PVMWC by TL 5,660 Trillion.

Application of higher ISA tax has surprisingly positive results. The change in  $\Delta$ PVNB after the increase in the ISA tax rate for SSK is 78 percent. This result is easily explained, however: the higher tax rates force an increase in national saving, resulting in larger future GDP. This effect shows up clearly in the columns for both government and private savings.

**Table 4:** Sensitivity Results: ISA Tax Rate Increase  
By 50 Percent (Trillion TL)

Values	$\Delta$ MWC	$\Delta$ AC	$\Delta$ GDPg	$\Delta$ GDPp	Total $\Delta$ PVNB
A	1,748	-660	6,254	-1,413	<b>5,929</b>
B	-3,912	-1,313	15,48	326	<b>10,581</b>
C	-5,66	-653	9,226	1,739	<b>4,652</b>

A: Original values, B: ISA tax increase by 50 percent, C: Difference between A and B.

#### 6.8.5 Adjustment for Administrative Costs

As mentioned in several places in this study, one of the problems with privatizing social security is the expected additional administrative cost. We assumed administrative costs equal to one percent of gross assets for the privatization trust funds in our original calculations. We increased this rate by 100 percent in the sensitivity analysis. As can be seen in the last row of table 3, it reduces the  $\Delta$ PVNB by TL 1,327 Trillion or 22 percent for SSK.

Overall, the  $\Delta$ PVNB is highly dependent upon the real rate of return, the real discount rate, and administration costs. No significant effect on  $\Delta$ PVNB occurs from changing either the average age of capital or elasticity of labor supply parameters.

### 6.8.6 Privatization Impact on Representative Individuals

Up to now, we have analyzed benefits and costs from a social perspective. The positive net present values of social benefits that we obtained cover the period, 2000 to 2050. However, not everyone will gain from privatization. Results of a similar analysis for the U.S. by Feldstein and Samvick (1998) suggest that many current Turkish workers would experience reductions in the wealth they get under the current law pay-as-you-go system. This is because they will pay higher taxes, but receive the same level of benefits that they would have received without privatization.

To see if this is also the case for Turkey, we calculated the change in wealth expected from privatizing the Turkish SSK for representative individuals born between 1945 and 1985. Each representative individual is assumed to earn the monthly average wage reported in ILO (1996b), to be in the labor force every year from age 25 to 60, and get retirement benefits until age 75.<sup>25</sup> The amount of the average yearly benefits assumed to be same one in ILO (1995b) that was converted to annual data using the procedure outlined in section 3.

For each representative individual the present value of benefits with privatization (PVPB), the present value of benefits with the current law pay-as-you-go system (PVCLB), the present value of contributions with privatization (PVPC), and the present value of contributions with the current law pay-as-you-go system (PVCLC) were calculated. The change in wealth for each representative individual is equal to  $(PVPB - PVCLB) - (PVPC - PVCLC)$ .

Table 5 presents a summary of the changes in public retirement wealth for representative individuals born between 1945 and 1985. The results are presented with and without a risk adjustment on privatization tax rates. With risk adjustment, tax rates under privatization must be higher to maintain trust fund solvency.

The results show that all representative individuals born 1945 and 1980 suffer net losses in wealth with the privatization associated with SSK. Only those who are born after 1980 would

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<sup>25</sup> This age is inline with the life expectancy in Turkey.

experience a net gain in wealth under SSK in the without risk adjustment case. No individuals gain wealth in the risk-adjustment case.

By looking the trend in the table, we can presumably conclude that all representative individuals born after 1985 would experience net gains from privatizing SSK in the no-risk case. There are no data available, however, to support the calculations necessary to determine when individuals start to gain wealth in the risk-adjustment case.

**Table 5:** Change in Wealth for Representative Individuals, By Year of Birth, Million TL (In 1995 TL Values)

<b>Years of Birth</b>	<b>W/O Risk Adjustment</b>	<b>Risk Adjusted</b>
1945	-125	-208
1950	-341	-558
1955	-643	-1047
1960	-971	-1613
1965	-1193	-2122
1970	-1169	-2394
1975	-871	-2367
1980	-292	-1980
1985	532	-1279

## 7. Conclusions

The main objective of this paper was to investigate, by applying a benefit-cost model, whether privatizing Turkish Social Insurances Institute (SSK) would be economically superior to the current pay-as-you-go system, given a set of relevant assumptions.

As shown in section 4, the current pay-as-you-go system would require much higher effective social security contribution rates for the next 50 years in order to pay promised benefits. With the current system, the deficit (the difference between statutory and effective contribution rates) would not disappear during the study period, 2000-2050. The higher taxes required to finance the deficit would probably distort the labor market equilibrium so severely that a substantial welfare cost of such taxes would occur along with a lower level of national saving, resulting in a smaller GDP for each year.

We have identified the sources of benefits and costs associated with privatizing the SSK. By applying the conventional benefit-cost model, we obtained results that indicate a long-run economic gain from privatizing the SSK. A number of sensitivity analyses were conducted to check the robustness of our findings. Therefore, our analysis indicates, from a social point of view, that privatizing SSK would quite likely produce a net economic gain in the long run. This would be achieved for future generations, however, at the expense of the current working population. Thus, from an individual standpoint, privatization would be a mixed blessing. As our analysis shows, the impact of privatization on representative individuals is negative for those who born before 1980. Our finding shows that older workers would be losers from privatization, while younger employees and their children would be net gainers. Specifically, those who will be working between 2000 and 2025 would be net losers since they would pay very high contribution rates. Those who would enter the labor force after 2025 would pay relatively low taxes and therefore be better off, *ceteris paribus*.

Our results indicate that the privatization of SSK should be given serious and immediate attention. This institution requires significantly higher effective tax rates (rates required to avoid a deficit) for the whole period, 2000-2050, under current law. Specifically, the effective tax rate under current law would be higher than the statutory rate for the entire period, and both rates would become equal at the end of the period. However, under privatization, the effective tax rate would be half of the statutory tax rate at the end of the period. As a result, the present value of net benefits from privatizing SSK is substantial. Our analysis shows that the net benefit of SSK from privatizing, in year 2050 alone, is 2.46 percent of GDP. This fact, alone, is sufficient to attract immediate attention to privatization or other reform options for this institution. It is hard to escape the conclusion, therefore, that the privatization of SSK is matter for urgent consideration.

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