Essays on Unintended Economic Consequences of Government Interventions

Short summary of the dissertation

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Overview of the Contributions

In my cumulative dissertation, I provide comprehensive and rigorous evidence on unintended economic effects of government interventions in three essays, each looking at a very specific question and contributing to different strands of literature. More specifically, I study unintended economic outcomes caused by behavioral responses of individuals to financial incentives created by specific policies. The research collected in this dissertation contributes to a better understanding of human behavior and decision-making in the context of specific policies, generating helpful insights to infer how to optimally design or improve policies.

In the first essay, this dissertation empirically tests the old-age support motive of fertility by identifying the causal effect of pension generosity on fertility. The results show that the enhancement of a Pay-As-You-Go (PAYG) pension system in a developing country creates incentives to save less for old-age in the form of own children traditionally serving as informal old-age providers within the family. Thus, a reform primarily intended to alleviate old-age poverty affects demography and the pension system's long-run contribution base. In the second essay, this dissertation shows that citizenship-by-investment programs provide the means, and are indeed used, to hide tax evasion from tax information exchange. Thus, efforts to promote international tax transparency create unintended and undesirable incentives for evaders to find new ways to circumvent the law. In the third essay, this dissertation shows that U.S. defense and security aid is associated with wealth accumulation in offshore haven bank accounts belonging to persons—most plausibly ruling elites and their cronies—from recipient countries. Thus, U.S. financial support intended to improve the stability and security of allied countries increases the scale and opportunity for corruption and creates incentives for rent-seeking activities.

All three essays have in common that their focus is empirical. In each essay, I analyze large data sets and apply empirical methods for causal inference to study specific unintended policy effects. The empirical analysis in each essay includes a number of robustness checks and falsification exercises to support the statistical credibility and the causal interpretation of the estimated effects. While all three essays are mainly empirical, essay 1 and 2 also formally motivate the empirical analysis: Essay 1 provides a qualitative model to clarify hypotheses on heterogeneous fertility responses with respect to women's age as well as the number and gender of previously born children. Essay 2 provides an analytical model illustrating the interplay between tax information exchange and citizenship-by-investment programs.

The three essays of this thesis contribute to the policy discussion by providing useful insights allowing to infer how to improve the effectiveness of specific policies. Essay 1 contributes to the policy discussion on the design of public pension systems, which in most countries are a major pillar to grant citizens economic security during retirement (Willmore, 2007; Barr and Diamond, 2009). In the light of the demographic development characterized by population aging and low birthrates, governments and societies around the globe have to (re-)consider how to provide for the growing number of old citizens, especially in developing and emerging countries. Thus, evidence on the fertility effects of public pensions can help to design pension systems that are more sustainable in the long-run, especially when declining fertility can erode the basis of PAYG pension systems. Essay 2 contributes to the policy discussion on the design of automatic tax information exchange mechanisms. The OECD and the U.S. are constantly revising the effectiveness of their mechanisms for the automatic exchange of tax information, namely the Common Reporting Standard (CRS) and the Foreign Account Tax Compliance Act (FATCA). A key issue in this process is to identify loopholes that have been found by evaders to undermine the effectiveness of information exchange. Thus, evidence on citizenship-by-investment programs as a channel used to circumvent tax information exchange can help to support the revision process of the information-sharing mechanisms. Essay 3 contributes to the policy discussion on the mechanisms underlying aid (in-)efficiency. The U.S. recently increased efforts to structurally evaluate their aid programs and to determine their actual impact (cf. Lawson, 2016). Thus, evidence on the incidence and extent of U.S. defense and security aid diversion can help to formulate appropriate policy advice, e.g., concerning the processes involved in foreign assistance, transparency and monitoring standards, and political and administrative accountability.

In the following, I will give a brief overview of the research questions, methodology, and findings of each essay of this thesis. All essays are based on stand-alone research papers.

Summary of the Contributions

Essay 1 "Pensions and fertility: Micro-economic evidence" (based on joint work with Prof. Alexander M. Danzer, Ph.D., KU Eichstätt-Ingolstadt) studies how the introduction and enhancement of public pension systems affect demography.

In caring about their economic well-being at old-age, individuals can secure sufficient and reliable provision through savings, a functioning pension system, or transfers from children (Galasso, Gatti and Profeta, 2009). A broad economic literature has been devoted to analyzing the substitutability between these different forms of oldage savings. Numerous studies have focused on the substitutability between private and pensions wealth, documenting a negative effect of public pension systems on financial savings (see, e.g., Feldstein, 1976; Leimer and Lesnoy, 1982; Attanasio and Brugiavini, 2003; Attanasio and Rohwedder, 2003). There is also a long standing debate in the literature on the effects of public pension systems on individuals' fertility decisions. Theoretically, the effect will depend on how the system affects the individuals' lifetime income profile and the underlying motive for procreation, i.e., children as a consumption good providing utility (Becker, 1960; Becker, Murphy and Tamura, 1990) or children as an investment good providing old-age support (Leibenstein, 1957). The historical experience of industrialized countries and a large theoretical and empirical macroeconomic literature suggest that fertility declines when governments introduce or expand pension schemes (see, e.g., Hohm, 1975; Ehrlich and Zhong, 1998; Ehrlich and Kim, 2007; Boldrin, De Nardi and Jones, 2015). Yet, there are not many micro-level studies providing quasi-experimental evidence on the short- and long-run effects of the introduction or expansion of formal pension systems on fertility decisions. Further, there is almost no evidence on developing countries as most papers that have studied the effect of formal pensions on fertility have focused on industrial countries. This is surprising given that in developing countries we expect the old-age security motive to be particularly relevant for individuals' fertility decisions considering the widespread poverty and a lack of financial savings instruments. Thus, in (poor regions) of developing countries the effect of the introduction or enhancement of formal pension systems on fertility is expectedly most relevant both in terms of its size and its impact on the sustainability of the pension system.

In this essay, we contribute to the literature on the impact of pensions on demography. We identify the causal effect of pension generosity—understood as both an expansion of potential beneficiaries and an increase in benefits—on women's fertility behavior on the micro-level. The theoretical basis for our study is the old-age security hypothesis of fertility (Leibenstein, 1957), implicitly postulating a trade-off between

children and other forms of pension savings. Thus, we expect that the introduction or enhancement of formal old-age pensions is associated with declining fertility rates. To test this link, we exploit Brazil's expansion of the PAYG pension system to formerly de facto excluded rural workers as a source of exogenous variation. This reform, which took place in 1991, equalized the coverage and benefit levels between urban and rural workers; so, rural workers experienced a substantial increase in public pension wealth. In our micro-level empirical analysis, we also explore heterogeneous fertility responses. The analysis of heterogeneous fertility responses is based on a qualitative model clarifying how fertility effects are expected to differ along three dimensions: the age of the women, and the number and gender of previously born children.

In our empirical analysis, we use data for over 30 years from the Brazilian National Household Survey (PNAD) and employ three quasi-experimental identification strategies to draw a big picture of the impact of the Brazilian pension reform on fertility: We use a difference-in-differences approach to investigate the short-run policy effect on birth probabilities and an event study approach to explore the dynamic long-run effect on the total number of births of women at the end of their fertility period. Beside the policy effect of the pension reform, we also estimate the elasticity of fertility with respect to pension wealth in an instrumental variable approach. Our results show that fertility reacts negatively to increases in pension generosity both in the short-run and in the long-run. The short-run effect of a reduced propensity of childbearing of women translates into a lower total number of children per woman in the long-run. Although, the effects are heterogeneous across women's age groups, birth parities, and the gender composition of previously born. The fertility response is concentrated among women who are closer to the end of their fertility period, women who already had children, and especially women who already had sons. A simple back-of-the-envelope calculation illustrates how the effect of the pension reform on fertility can reduce the contribution base in the long-run, potentially eroding the sustainability of a PAYG pension system.

Essay 2 "Escaping the exchange of information: Tax evasion via citizenship-by-investment" (based on joint work with Prof. Dr. Dominika Langenmayr, KU Eichstätt-Ingolstadt) studies 'citizenship-by-investment' ('golden passport') programs as a new way for tax evaders to hide their offshore holdings by circumventing tax information exchange.

There is comparatively little systematic evidence on offshore tax evasion owing to the lack of systematic high-quality microdata on illegal activities reflecting tax evasion. Nevertheless, there are several studies providing insights into offshore tax evasion: Global estimates show that private individuals hold about US\$ 5.9 trillion (Zucman, 2013) or around 10% of the world's GDP (Alstadsæter, Johannesen and Zucman, 2018) in offshore banking centers. Previous research has also shown that offshore wealth is very concentrated; the same holds for offshore tax evasion: Alstadsæter, Johannesen and Zucman (2019) show that the 0.01% richest households evade about 25% of their tax liability with the use of offshore tax havens, and that these households own about 50% of all the money held in tax havens.

In the last decade, we have seen a lot of efforts by the OECD, the G20, and several other countries around the world to make offshore tax evasion much more difficult. Since then, tax information exchange agreements between countries have become the main policy instrument to enhance transparency on financial accounts—especially those located in tax havens—and to enforce the taxation of capital income across borders. Tax information exchange started out at the bilateral level and with information exchanged upon request. Later on, these bilateral agreements were superseded by mechanisms for the automatic exchange of tax information on multilateral level, namely the CRS and FATCA in the United States. The success of these agreements has been studied by several researchers, focusing on whether the announcement or initiation of tax information sharing creates deterrence incentives: for instance, Tax Information Exchange Agreements (Johannesen and Zucman, 2014; Hanlon, Maydew and Thornock, 2015; Heckemeyer and Hemmerich, 2020; Ahrens and Bothner, 2020), the EU Savings Directive (Johannesen, 2014; Caruana-Galizia and Caruana-Galizia, 2016), the U.S. Foreign Account Tax Compliance Act (FATCA, De Simone, Lester and Markle, 2020), and the OECD's Common Reporting Standard (Miethe and Menkhoff, 2019; Casi, Spengel and Stage, 2020). This research has shown that tax information exchange reduces offshore tax evasion at the bilateral level. Yet, several studies show that this does not imply a transition to legality, i.e, that the money is repatriated and taxed, but that tax evaders find new ways to hide their money from the tax authorities: for instance, by relocating money to other, non-compliant tax havens (Johannesen, 2014; Johannesen and Zucman, 2014; Casi, Spengel and Stage, 2020), by using shell companies (Johannesen and Zucman, 2014), or by investing in alternative assets not subject to reporting such as residential real estate and artwork (De Simone, Lester and Markle, 2020).

In this essay, we contribute to the literature on individual tax evasion by investigating-theoretically and empirically—a novel way that tax evaders can find to avoid information exchange and keep their money hidden from the tax authorities, namely citizenship-by-investment (CBI) programs. CBI programs allow private persons to buy a country's citizenship in exchange for financial transfers, e.g., for an investment in real estate, businesses, or for a donation to the government. How does this help with tax evasion? In principle, any form of tax information exchange is based on tax residency, be it a bilateral agreement or an automatic tax information exchange mechanism. While the tax residency is generally unaffected by acquiring a new citizenship (i.e., without actually relocating to the country), the documents obtained under CBI programs (e.g., passport) can be used by evaders to open new bank accounts pretending to be tax resident in one of the countries with a CBI program. Then, any account information collected, e.g., under the CRS, is sent to the CBI country instead of the evader's true home country. Thus, CBI programs allow circumventing tax information exchange.

The empirical test in this essay is based on an analytical model, framing tax evasion as a rational decision of heterogeneous individuals and illustrating the interplay between tax information exchange and CBI programs in a setting of optimal policy choices by multiple governments. We show analytically that high-income individuals acquire a new citizenship to lower the probability that their tax evasion is detected through information exchange. In our empirical analysis, we use data on cross-border bank deposits from the Bank for International Settlements over the 2010-2018 period to test this hypothesis. The empirical analysis focuses on 6 CBI programs that are deemed to be at high risk of abuse by the OECD, namely, Cyprus, Malta, Dominica, Grenada, St. Lucia, and Vanuatu. We employ a staggered two-way fixed effect panel regression approach to estimate the average policy effect of implementing a CBI program on cross-border bank deposits and an event study approach to investigate the dynamics of this effect. Our results show that deposits in tax havens belonging to persons from CBI countries immediately and persistently increase after a country starts offering a CBI program. Thus, we provide indirect evidence that tax evaders indeed use these programs to escape information exchange and to hold billions of dollars undetected in offshore bank accounts.

Essay 3 "U.S. defense and security aid and hidden money in offshore bank accounts" analyzes whether money provided by the U.S. to support foreign defense and security forces is lining the pockets of powerful elites from recipient countries.

The large literature on aid effectiveness provides extensive evidence on the impact of aid on domestic savings and the economy, the relationship between aid and economic growth, whether aid improves human development (e.g., reducing infant mortality), or how effectively aid reduces poverty (see Quibria, 2014, for a review). A number of studies emphasize that the (positive) impact of aid on growth, human development, and poverty depends on the quality of policies and public institutions of recipient countries (Burnside and Dollar, 1998, 2000, 2004). One strand of research in this literature directly addresses the question of how aid affects the institutional environment and the scope and breadth of corruption in recipient countries. Theoretically, foreign aid potentially facilitates corruption as powerful elites and influential groups may intensively compete for the resources (Svensson, 2000); yet, the empirical evidence is inconclusive. While some studies show that dependence on aid undermines the quality of governance and public institutions and increases corruption (Knack, 2001; Bräutigam and Knack, 2004; Busse and Gröning, 2009), others suggest that aid reduces corruption (Tavares, 2003; Okada and Samreth, 2012; Asongu and Jellal, 2013; Mohamed et al., 2015) or find no effect at all (Menard and Weill, 2016; Krasnigi and Demukaj, 2021). However, systematic evidence on aid diversion, i.e., the extent of how foreign assistance is afflicted by corruption and embezzlement is scarce. A nascent literature addresses the question of aid capture by corrupt elites indirectly by linking cross-border capital flows with aid disbursements. Andersen, Johannesen and Rijkers (2022) find strong and robust evidence for the diversion of World Bank aid by ruling elites from highly aid-dependent recipient countries. In contrast, Aiyar and Patnam (2021) do not find similar evidence for the diversion of IMF loan disbursements, arguing that the incidence and extent of aid capture depend on the type of aid and the providing institutions.

This essay contributes to the literature on aid effectiveness, specifically to the empirical literature on corruption and rent-seeking in the presence of aid, by investigating whether U.S. defense and security aid is associated with capital flows to offshore destinations suggestive for aid capture by ruling elites of recipient countries. The question of U.S. defense and security aid capture is of interest in view of its magnitude and reach, and considering that the diversion of funds would directly prevent resources from being spent on projects intended to improve security and stability. Previous research shows that the defense and security sectors are generally non-transparent and vulnerable to corruption (Gupta, De Mello and Sharan, 2001; Feinstein, 2011; Cockcroft, 2012; Pyman, 2017). In the last 20 years, the issue has also become more visible through

government reports and media exposure in the context of the wars in Afghanistan and Iraq. U.S. authorities documented numerous cases of illegal activities related to U.S. defense and security aid, indicating that the misuse of funds is a structural problem rather than an isolated incidence. Yet, a remaining question is whether the diversion of U.S. defense and security aid is a structural problem so serious that substantial amounts of aid show up in offshore bank accounts.

In the empirical analysis, I use the U.S. Government Foreign Assistance dataset providing project-level information on all U.S. foreign aid spending activities, paired with information on cross-border bank deposits from the Bank for International Settlements for the 2013-2018 period. I employ a two-way fixed effect panel regression approach that relies on within-country variation to analyze the dynamics of private wealth accumulation in offshore bank accounts coinciding with U.S. defense and security aid flows. My results show that U.S. defense and security aid disbursements are linked with increasing offshore bank deposits originating from recipient countries. Yet, only deposits held in countries known for providing financial privacy laws and private asset management services significantly increase, while deposits held in other international banking centers are rather unaffected. The incidence of haven deposits strongly increasing simultaneously with U.S. defense and security aid disbursements is not systematic, but is concentrated among a small number of countries receiving high aid disbursements. A consistent explanation for the totality of my findings is that persons from recipient countries—most plausibly ruling elites and their cronies—siphon off U.S. defense and security aid and hide the captured money in offshore havens.

Abstracts

Paper 1—Pensions and Fertility: Micro-Economic Evidence (based on joint work with Alexander M. Danzer). Forthcoming in the *American Economic Journal: Economic Policy*.

This study identifies the causal effect of pension generosity on women's fertility behavior. It capitalizes on Brazil's expansion of the pension system to rural workers, whose pension wealth subsequently more than tripled. Difference-in-differences, instrumental variable and event study methods show that the pension reform reduces the propensity of childbearing of women in fertile age by 8% in the short-run. Completed fertility declines by 1.3 children within 20 years after the reform, reducing the contribution base of the Pay-As-You-Go pension system in the long-run. The fertility response is strongest at higher birth parities, among older women and among mothers with sons.

JEL classification. J13, I38, H55, D15

Keywords. Pension wealth, Fertility, Old-age security hypothesis, Quasi-experiment, PAYG, Brazil

Paper 2—Escaping the Exchange of Information: Tax Evasion via Citizenship-by-Investment (based on joint work with Dominika Langenmayr). Unpublished manuscript.

With automatic exchange of tax information among countries now common, tax evaders have had to find new ways to hide their offshore holdings. One such way is citizenship-by-investment, which offers foreigners a new passport for a local investment or a fixed fee. We show analytically that high-income individuals acquire a new citizenship to lower the probability that their tax evasion is detected through information exchange. Using data on cross-border bank deposits, we find that deposits in tax havens increase after a country starts offering a citizenship-by-investment program, providing indirect evidence that tax evaders use these programs.

JEL classification. H26, K42, H24, H87

Keywords. Tax evasion, Citizenship-by-investment, Tax information exchange

Paper 3—U.S. Defense and Security Aid and Hidden Money in Offshore Bank Accounts. Unpublished manuscript.

Is money provided by the U.S. to support foreign defense and security forces lining the pockets of corrupt elites from recipient countries? I address this question by analyzing the dynamics of private wealth accumulation in offshore bank accounts coinciding with U.S. defense and security aid flows. Using data on U.S. foreign assistance paired with data on cross-border bank deposits, I document that U.S. defense and security aid disbursements are linked with increasing offshore bank deposits originating from recipient countries. Yet, only deposits held in international banking centers known for financial privacy laws and confidential asset management services significantly increase. The entire effect is concentrated among a small number of countries receiving high aid disbursements. A consistent explanation for the totality of my findings is that persons from recipient countries—most plausibly ruling elites—siphon off U.S. defense and security aid and hide the captured money in offshore havens.

JEL classification. F35, H56, D73, K42

Keywords. U.S. defense and security aid, Offshore havens, Rent-seeking, Corruption

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