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Construction of a Narrative Instrument for Government Investment

Marius Clemens* Claus Michelsen[a] Malte Rieth[b]

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Abstract

The article documents the construction of a narrative instrument for government investment, used in the paper 'An Estimation and Decomposition of the Government Investment Multiplier'.

JEL: E62, E65, H54

Keywords: Fiscal policy, public investment, structural vector autoregression, instrumental variable, general equilibrium model, Germany.

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1 Historical Overview of German Federal Public Investment Policy

Germany's economic development and growth have been significantly influenced by its federal public investment policies. From post-war reconstruction to modern infrastructure development and sustainability initiatives, German policymakers have continuously shaped public investment strategies to address various economic challenges and societal needs.

Following the devastation of World War II, West Germany embarked on a journey of reconstruction and recovery. The Marshall Plan provided financial assistance that enabled the country to rebuild its infrastructure, industries, and cities. The German federal government played a central role in coordinating investment efforts, focusing on sectors essential to revitalizing the economy, such as manufacturing, energy, and transportation. Investments in housing and urban development were also aimed at addressing the acute housing shortage caused by the war. This period laid the foundation for Germany's "economic miracle," characterized by rapid industrialization, export-led growth, and rising living standards.

The concept of the "social market economy," championed by economists such as Ludwig Erhard, guided Germany's postwar economic policies. Central to this approach was the idea of combining free-market principles with social welfare measures and active government intervention to promote economic stability and social cohesion. Infrastructure development emerged as a key priority, with significant investment in road networks, railways and telecommunications. The construction of the highway system, for example, facilitated transportation and stimulated economic activity and regional integration. In addition, investments in education, health and social services underpinned Germany's commitment to human capital development and social inclusion.

German reunification in 1990 presented unprecedented challenges and opportunities for federal public investment policy. The government embarked on ambitious projects to modernize infrastructure in the former East Germany and to narrow the economic gap between the eastern and western regions. European integration further influenced investment priorities, as Germany participated in transnational initiatives to promote economic cooperation and connectivity within the European Union. Projects such as the European high-speed rail network and trans-European transport networks received significant funding, reflecting Germany's commitment to promoting cross-border infrastructure and trade.

In the 21st century, German public investment policy has increasingly focused on sustainability and digitalization to address emerging challenges such as climate change and technological disruption. The Energiewende exemplifies Germany's commitment to renewable energy and environmental protection, with significant investments in solar, wind, and biomass projects. In addition, initiatives such as the National Urban Development Policy and the Digital Agenda 2025 reflect the government's efforts to promote sustainable urbanization and harness the potential of digital technologies for economic growth and social progress.

2 A Narrative Instrument for Public Investment Shocks: Overview of Methodology

The main purpose of this narrative analysis of changes in German federal investment policy is to develop a record of events that can be used as a valid instrumental variable for public investment programs. The development of the narrative policy instruments proceeds in five steps. We follow the influential work of Fieldhouse et al. (2018).

We first restrict the sample for consistency. Secondly, we identify binding, significant changes in public investment by the federal government that are expected to affect investment by other local governments (states and municipalities) and, most importantly, private investment. We thirdly quantify the investment stimulus. In the fourth step, we document when each policy change was announced and when it was actually implemented. Finally, we classify each major investment program as either "cyclical" (endogenous) or "non-cyclical" (exogenous). In the following, we document the procedures and data sources used in each of these steps in detail. In the main text, we provide a comprehensive summary of the classifications outlined in the subsequent sections.

2.1 Sample Restriction

The sample is restricted to observations starting in 1970Q1. This is for institutional but also for data availability reasons. For most time series, sufficiently granular quarterly data is only available from 1970 onward. Most importantly, there was a substantial change in the institutional setting: In 1970, for the first time, municipalities were given the opportunity to carry out their redevelopment and development tasks in public infrastructure within a joint financial and legal framework with the federal states and the federal government.

The institutional setting is also an important restriction for the identification of relevant investment programs. We focus on programs financed by the federal government, as consistent data for local and federal states' budgets are not available.

Federal, state and local authorities each have different tasks in financing public infrastructure investment. The federal government invests directly in the form of tangible investments for which it is responsible, such as federal highways and waterways, long-distance roads and railways, the internet, the military, and buildings and equipment for federal agencies. At the same time, it provides investment grants to the states, some of which are passed on to the municipalities. These investment grants are usually tied to a clearly defined investment objective, which is either in the territory of the state or in the territory of the respective municipalities. The states are responsible for investment in universities, hospitals, local airports, roads, and public transportation. Investment in local public infrastructure on the municipal level include, among others, swimming pools, sports facilities, playschools and schools but also local roads and parks.

In purely financial terms the municipalities are just as important as the federal government—both invest around 40% of total public investment. However, phases of increased investment activity are initiated by increased federal government spending. The reason is that on the municipal level, large shares of the budgets are tied to so-called "obligatory tasks" like public safety, fire departments, and social security, while at the same time the municipalities are legally borrowing-constrained. Therefore, most municipalities in Germany lack sufficient financial resources for major investment projects. These are usually implemented when unexpected additional tax-revenues or additional financial resources from federal programs are made available.

For this reason, and also because the investment plans of the individual states and municipalities are not available, we focus on the federal government's investment spending when developing our instrument. This includes investments in property, plant and equipment, as well as investment grants to states and municipalities, which are also invested based on earmarking, albeit by a regional authority other than the federal government. As a result, we expect our instrument to cover a large portion of public investment as defined in the national accounts.

We focus on significant federal policy events that are expected to have a sizable impact on public investment activity. Therefore, we include investment programs with a duration of more than one year and ignore smaller programs with a total volume of less than 500 million euros.

2.2 Sources of Information, Public Investment and its Classification in National Accounts and other Statistics

The political measures that have an impact on the public capital stock include direct public investment in buildings, equipment, or R&D, direct allocations to federal states and municipalities, which also invest in their respective areas of jurisdiction, such as investments in education and healthcare facilities, and allocations to private companies. Public investment in fixed assets is referred to as gross fixed capital formation in the national accounts and is included in the use of gross domestic product. The direct allocations of funds initially appear as domestic investment grants from the federal government to the federal states and municipalities and are then also recorded in the national accounts as gross fixed capital formation as soon as the funds are spent by the federal states and municipalities. All other investment grants to private companies and organizations are recorded in the government account and appear in the national accounts under private investment. However, a significant proportion of these are private-public partnerships that are subsidized through this account, as well as private companies that are largely state-owned, such as Deutsche Bahn AG, and whose responsibility has changed between private and public over the years.

We use a variety of sources to identify legal and regulatory changes and use primary sources wherever possible, both when searching for and analyzing policy changes. Where possible, cross-references are also made between identified changes in different sources. Table 1 lists all primary sources used to create the narrative analysis.

Source	Frequency	Institution
Finanzbericht (financial report)	annual	German Federal Ministry of Finance
Jahreswirtschaftsbericht (annual economic report)	annual	German Federal Ministry of Economic Affairs
SVR Jahresgutachten (annual report)	annual	German Council of Economic Advisors
Gemeinschaftsdiagnose (joint economic forecast)	bi-annual	Leading economic research institutes
Law database	daily	German Bundestag

Table 1: Lists of primary sources for the narrative series.

Over the decades, the responsibilities and spheres of influence of the relevant institutions have changed, particularly because areas of public infrastructure have been partially privatized. The main sources used to identify and analyze important policy changes include the texts of public laws, the federal government's budget, and regular federal government reports such as the Financial Report and the Annual Economic Report. The sections of the Ministry of Economic Affairs' Annual Economic Report and the Ministry of Finance's Financial Report that deal with public investment and investment-related measures are also searched for information. We also obtain information for estimating the volume of investment measures and for determining forecast errors from the semi-annual report of the Joint Economic Forecast and the annual report of the German Council of Economic Experts.

Once investment measures have been identified, newspapers, financial news and cash results from the federal states and municipalities are used to support the search for information on decisions and their publication at federal level. This is mainly done by searching for keywords related to changes in investment policy in search windows on the Bundestag's website that are close to the event. After a rough determination of the publication date of a bill, we then investigate backward to the publication of the bill. Final bills or amendments to bills that are published in the Bundestag almost always include a detailed background and overview of the original proposed drafts, public comments received, and any subsequent amendments to the drafts. All significant policy changes identified and documented in this narrative analysis begin with a table that includes the federal investment program, the projected annual impact of the policy on investment-related spending (in nominal billions), our determination that the news is published, the effective date of the policy, and our classification of the policy as either cyclically or non-cyclically based. These policy-specific tables are included in each of the chronologically listed measures.

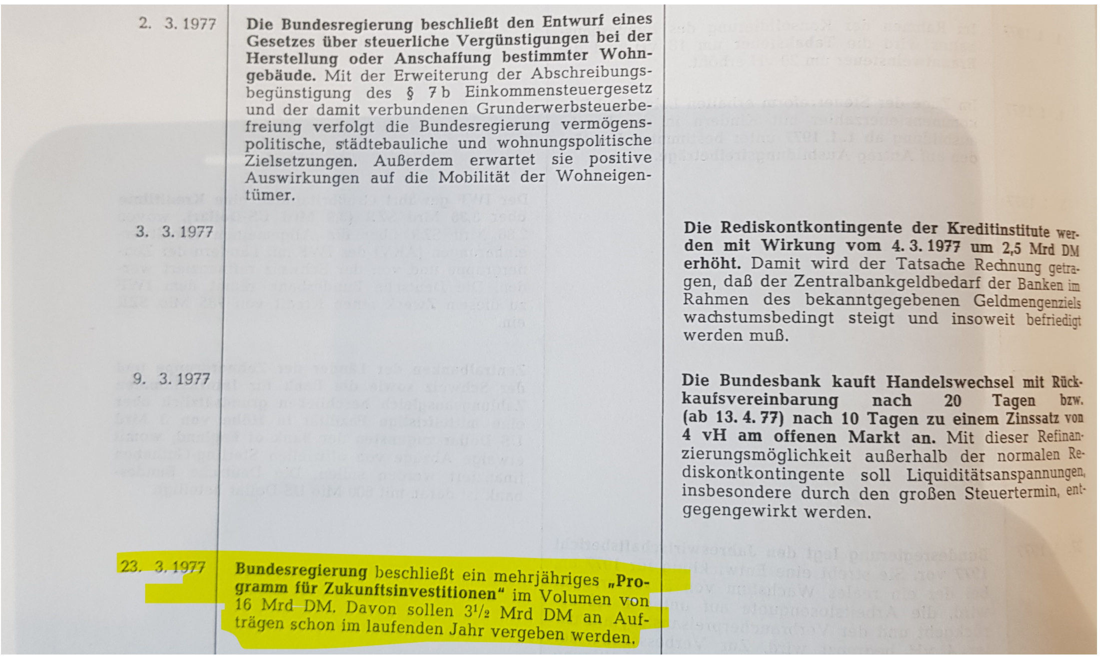
2.3 Selection Process

When searching for investment programs, one cannot simply use the budget plan for the current fiscal year as a basis. This is because budget plans usually show the additional investment expenditure for individual investment projects, like road upgrading, but not the expenditure for the overall program consisting of different projects. In addition, the budget plans do not indicate when the investment project was announced and decided.

Therefore, we select public investment programs step by step according to the type of source. Since the online archive of the German Bundestag contains about 167,000 legislative documents and reports for the period since September 7, 1949, including 8,700 laws, which is too extensive for a preliminary rough estimate, we first searched the archive of the Federal Ministry of Finance for historical investment programs. We mainly concentrate on the *Finanzbericht* (The financial report) and budgetary drafts and final plans, which are detailed reports about the German economy and the revenue and expenditure policy of the federal government. However, the reports are not available in a digital form, only for the recent years. In each report from 1970 onward, there is a detailed timeline of government decisions on a daily base which includes tax and law changes, but also announcements of expenditures. Additionally, it is also indicated if an expenditure measure is considered an investment or not. Sometimes it is also explained in which context (e.g. as a stability program after a crisis) the measure is announced. We further get information about the size and duration as well as dates of announcements and resolution of a program. In total, we identify 24 investment programs or measures from the federal government between 1970 and 2018. But not for all measures we obtain the full set of information about size, announcement date, duration, and cause.

In contrast to consumptive expenditures, transfers, or other expenditures, these measures are titled "investments" or "investive". This does not automatically mean that the series contains only public investment by the definition of the National Account Statistics. In the reports, the definition "investive expenditure" is broader because it also considers investment grants and allowances besides public gross capital formation as defined in the national accounts. Furthermore, it contains federal government investment assignments to states and municipalities that obtain additional earmarked funds only for investment purposes. Thus, to some extent, it also reflects the investment behavior of German municipalities who bear the largest burden of public gross capital formation.

In a next step, with this information from the available physical archive, we specifically search for additional information about the identified events by using mainly two sources: the German joint economic forecast and the legislative text forms of the German Bundestag. The joint economic forecast is an independent institution and consists of the five major German economic research institutes (DIW Berlin, ifo Munich, RWI Essen, IWH Halle and ifW Kiel) of the German Leibniz



2. 3. 1977 **Die Bundesregierung beschließt den Entwurf eines Gesetzes über steuerliche Vergünstigungen bei der Herstellung oder Anschaffung bestimmter Wohngebäude.** Mit der Erweiterung der Abschreibungsbegünstigung des § 7 b Einkommensteuergesetz und der damit verbundenen Grunderwerbsteuerbefreiung verfolgt die Bundesregierung vermögenspolitische, städtebauliche und wohnungspolitische Zielsetzungen. Außerdem erwartet sie positive Auswirkungen auf die Mobilität der Wohneigentümer.

3. 3. 1977 **Die Rediskontkontingente der Kreditinstitute werden mit Wirkung vom 4. 3. 1977 um 2,5 Mrd DM erhöht.** Damit wird der Tatsache Rechnung getragen, daß der Zentralbankgeldbedarf der Banken im Rahmen des bekanntgegebenen Geldmengenziels wachstumsbedingt steigt und insoweit befriedigt werden muß.

9. 3. 1977 **Die Bundesbank kauft Handelswechsel mit Rückkaufsvereinbarung nach 20 Tagen bzw. (ab 13. 4. 77) nach 10 Tagen zu einem Zinssatz von 4 vH am offenen Markt an.** Mit dieser Refinanzierungsmöglichkeit außerhalb der normalen Rediskontkontingente soll Liquiditätsanspannungen, insbesondere durch den großen Steuertermin, entgegengewirkt werden.

23. 3. 1977 **Bundesregierung** beschließt ein mehrjähriges **„Programm für Zukunftsinvestitionen"** im Volumen von 16 Mrd DM. Davon sollen 3½ Mrd DM an Aufträgen schon im laufenden Jahr vergeben werden.

Figure 1: Example for an investment program collected from the BMF Finanzbericht 1977: Program for Future Investment decided on 23th March 1977. *Notes:* The German government decides on a multi-year "Program for Future Investment" with a volume of DM 16 bn, of which DM 3.5 bn are to be placed in the current year.

Gemeinschaft. Since 1947 the institution has provided forecasts covering the entire National and Fiscal Account of the German economy biannually. Furthermore, it provides detailed information about the German economy and fiscal policy measures which are published in a report, available online since 2007 (See `https://gemeinschaftsdiagnose.de`).

We augment our investment program series by additional (e.g. forecasts) or updated information (e.g. detailed expenditure program after the reunification) from printed reports that are archived in the library of the DIW Berlin for the years prior to 2007. Legislated and draft laws are available by the German Bundestag online. We use this online archive to collect further details about the size and duration of the specific investment programs and as additional proof. The archive contains 167.000 legislative documents and reports for the period since 7th September 1949, of which 8.700 are enacted laws. We can search specifically for investment programs with the information from the physical archive at hand, as the latter contains the calendar days of the announcement and resolution of the programs. In this way, we collect additional chronological legislative notes from the online archive for most investment programs, but not all programs, as some were covered by general warrants and did not require new legislation. Investment proposals are often published in the form of legislative notes during the year. These notes contain the essential information for the corresponding project, including the current situation and the reasons for the projects. Some of the notes also contain a quantification of the investments.

In total, we collect information on 24 investment programs for the period 1970Q1–2018Q4. Table 1 lists the programs. For example, in 1977Q1 the German government started a 6.7 bn Euro five-year Program for Future Investments (No. 4), in which states and municipalities were involved. The Regulation Statement foregrounds the longer-term, growth, and structural economic motivation for the program. Consequently, it contained mainly infrastructure investments. Business cycle stabilization and employment policy goals are not mentioned. The federal government has earmarked 4.1 bn Euro for its own share. The states and municipalities had planned to spend 1.6 bn Euro and 1 bn Euro, respectively.

2.4 Quantification

Policy changes must be significant enough that the primary sources explicitly quantify projections of their impending impact. For each measure, we use information from the relevant sources to obtain an ex-ante estimate of the likely impact on public investment, measured in annualized billions of nominal Euro.

We use the total amounts of the programs but we also calculate by periods of duration normalized quarterly public investment numbers to provide measures for the potential impact of the programs. Furthermore, we calculate the investment ratio by dividing the quarterly investment by the potential output.

For relatively large and long-lasting changes, such as the German Unification Investment Program, the potential impact on public investment is annualized using a "two-year rule," which assumes that only half of the full potential impact is realized within the first year after enactment. The two-year rule is intended to account for the likelihood that some investments, particularly in the construction sector, will require some lead time after enactment, e.g., as a result of project planning.

We also make a deduction in the first year based on the month of the quarter in which the law was passed. For example, if a law is passed in December of a year, the full quarterly effect is not applied, but only 1/3 of the quarterly calculation. Since it is assumed that the full amount of funds will flow out, the remaining funds are spread evenly over the remaining quarters and years.

For example the Balancing Economic Disparities Act of 1988 was enacted on November 7, 1988, which is the 2nd month of the 4th quarter. The total volume of the program is 12.3 billion euros, which would result in an additional investment of about 0.3 billion euros per quarter over the entire period of the program until the end of 1998. However, the timing of the program means that only 2/12 of the funds will be received for the first year. This means that only an additional 0.05 billion euros will be invested in the first year, while the amount will be somewhat higher in the remaining years.

In some cases, running programs were simply extended for the same amount before they expired. We have not listed these legislative changes or new decisions separately, but have taken them into account in the respective time allocations. For example, the Energy Efficiency Investment Promotion Program was extended from 2 to 4 years at the same volume before it expired. We have not explicitly taken this extension into account. Therefore, we consider only the initial authorization as a significant policy change. In other cases, such as the higher education pacts, there were time gaps or additional funds, so we explicitly included the extensions.

All of these calculations and specifics are explicitly explained in the descriptions of each program (see below). To estimate the quantitative aspects of the policy, we rely on information from the federal government, the Ministry of Finance and the Ministry of Economic Affairs. We also use information from the annual or periodic accounts and cash figures of the federal states and municipalities to classify the respective types of expenditure, e.g. investment expenditure in the education sector. Newspapers, financial journals, and mortgage industry newsletters are also used, particularly to estimate the timing of program announcements, but also to look for projections for policies that are difficult to quantify.

2.5 Timing

At the operational level, a distinction needs to be made between different types of investment. In the national accounts, construction investment is recorded according to the progress of construction. This is in contrast to cash statistics, which record investment as it is paid for. The advantage of national accounts statistics is that construction progress approximates actual output. Investment in equipment is generally valued at acquisition cost, which includes the costs of transferring ownership, such as trade and transport margins or assembly costs, as well as non-deductible VAT. Internally produced equipment is valued at the production price of comparable goods. The starting point for the calculation of R&D investment is the determination of the production values of these services. Trade flows of R&D services between sectors and the rest of the world are then taken into account to determine the value of R&D investment. In practice, delays can also occur for these two types of investment.

Another important factor is that the federal government or the states often pay investment grants to the municipalities, which in turn invest them. These funds can be used to top up existing projects (school shop projects) or to invest in new projects. In any case, both direct investment by the federal government and indirect investment via investment grants to the states and municipalities lead to delays in effectiveness, since although the funds are usually fully drawn down at the end of an investment program, the outflow of funds is slower at the beginning. Accordingly, the Federal Statistical Office assumes an ideal-typical hump-shaped progression to take account of construction progress.

The quantified policy events are therefore best understood as news shocks about upcoming federal public investment programs, which initiate public investment at the lower federal levels. Therefore, we date each policy intervention to the month we determine that it was publicly announced and thus influences stakeholders' expectations. In the case of investment programs, this is usually the quarter in which they were announced in a bill, but not necessarily the quarter in which they came into effect.

2.6 Classification by Motivation

We seek to classify exogenous policy changes that are unrelated to the prevailing business cycle or that exhibit some degree of short-term endogenous, economically driven policy response. In other words, we aim at ruling out reverse causality by focusing on investment programs that have long-term objectives only. Our classification into exogenous and endogenous is primarily based on identifying the stated or perceived motivations behind each policy measure. We do this by analyzing historical documents, paying particular attention to the justifications given by policymakers and the press, the nature of the investment program, its relationship to the state of the economy, and the time horizon of the policy objectives.

In the case of spending programs, the duration of such programs is often relevant in distinguishing between an investment program and a fiscal stimulus program. Investment programs are often designed for a longer period than two years, mainly because it is known that it takes time for the total volume of investment to be fully reflected in an increase of the capital stock and to have its full productive effect. On the other hand, fiscal stimulus programs often have a short-term focus, as they are designed to stabilize the economic situation, mostly during recessions. As a result, they are usually not designed to last more than two years.

In addition to the legislative texts, the most important data sources for identifying political motives are the reports and hearings of the Bundestag and Bundesrat, the financial report of the federal government, the annual report of the German Council of Economic Experts, the semi-annual joint economic forecast reports of the leading economic research institutes and newspapers. The reports explain the motives of the committees and the relevant economic context. The reports often include additional views or dissenting opinions from members, providing a range of perspectives. The final legislative text published in the Bundestag always includes a detailed background and history of the regulation, shedding light on the motives for policy changes, as well as a discussion with the relevant experts.

Business cycle stabilization policy

Measures that are categorized as fundamentally cyclically in nature tend to focus on short-term outcomes, such as stimulating housing construction in a recession, are categorized as cyclical stabilization policy instruments. Legislative instruments for such policy changes also tend to be drafted and passed quickly, with a relatively short legislative history and a narrow focus. Policymakers tend to be quite explicit about cyclical concerns and objectives, especially when measures are implemented close to recessions. Measures taken during or close to recessions are closely scrutinized, and the bar for classification as non-cyclical is set particularly high, but are not categorically classified as cyclical, although only in rare cases they are classified as non-cyclical. In analyzing committee reports, signing statements, and the like, we tend to interpret phrases such as emergency, crisis, recession, unemployment, downturn, depression, stimulus, and recovery as strong indications of cyclical concerns, although such terms need to be evaluated in the context of the phrases surrounding them. When inferring motives from quotes from politicians or other primary sources below, such particularly informative expressions are usually highlighted in bold within broader quotes to make our interpretation and the relevant context transparent.

Potential growth and structural policy

Conversely, policies motivated primarily by social, budgetary, or other more ideological policy objectives are classified as non-cyclical, unless the record also indicates significant short-term economic concerns. It is the political rather than the economic context that shapes the development of these non-cyclical policy changes, which are motivated by long-term structural changes, such as the government's emphasis on increasing the potential output, equal infrastructure in the various regions, improving the spatial and technical facilities in kindergartens, schools, and universities, or improving the technological potential of the economy as a whole through digitalization. Legislative measures classified as non-cyclical emphasize longer-term outcomes, such as increasing broadband connections or improving school coverage in structurally weak regions. Legislative instruments for such policy changes tend to be slower moving. They often focus on broad, long-term structural policy objectives. The drafting of new legislation initiated by such bills is usually classified as non-cyclical. More generally, measures classified as non-cyclical are those that have been shaped by previous legislation or triggered by events that are fundamentally unrelated to the business cycle. Examples of phrases that we generally understand as indicating such non-cyclical motives are "long-term, far-sighted, comprehensive, regional inequalities, affordable housing, increasing labor supply, capacity building, budget deficit, technological capability, potential growth", although again context is important.

Based on our reading of the historical record, we classify all significant policy changes as either cyclical or non-cyclical, as this binary classification is relatively straightforward and a more precise distinction between non-cyclical objectives is not particularly relevant. In a further step, we divide non-cyclical programs into different sub-categories according to their intention and main focus. These include programs to reduce regional structural disparities, investment programs in education, and technological improvement programs.

2.7 Potentially concurrent non-investment programs

We searched the relevant sources for non-investment public spending programs and ensured that they are not concurrent with the identified investment programs. We found many non-investment programs. Unlike the investment programs, these are not reported separately as consumption programs but classified on the basis of their composition and objective. Some of the larger, well-known non-investment spending programs in Germany include housing benefit reforms (1970, 1984), pension reforms (1972, 1983, 1986, 1992, 1999), labor market reforms (Hartz I-IV, 2001-2005), the introduction of the Riester pension (2001), the introduction and increases of childcare allowance, child benefit, parental allowance (1996, 2006, 2008), active labor market measures (short-time work, 1993, 2008, further training and integration, 1993, 1994, 2016), as well as health and long-term care reforms (1972, 1984, 1993, 1994, 2004, 2015).

Out of these non-investment programs, four are enacted in the same quarter as an investment program. Two of these (the increase in child benefit and the child supplement in October 2008 and the extension of short-time work in December 2008) are associated with an endogenous program (stimulus package I) and thus excluded from the instrument anyway.

Another one of the four was part of a long-term care reform in 2015 with several laws ('Pflegestärkungsgesetze') to strengthen long-term care. It was introduced at the same time as the municipal investment promotion laws. However, the non-investment program mainly increased social benefits in kind within public consumption. These are very specific medical treatments and care services that were financed by an offsetting increase in social security contributions. It is therefore unlikely that the reform had a confounding impact as the cost of the increase in expenditures was borne by households themselves.

Another public consumption-oriented program was the Child and Youth Strengthening Act ('Gesetz zur Stärkung von Kindern und Jugendlichen') that potentially conflicts with one investment program, specifically the Higher Education Pact III. Among other things, this law aimed at improving the ratio of staff to children and supported the training of staff and the promotion of language skills. The exact costs of the measures are not quantified in the documents. But the law itself did not provide any federal funding and merely gave the states the option of using their own funds in a more targeted manner if necessary. Thus, it is unlikely to affect the estimation as there were no direct federal outlays at the same time of the instrument observation.

2.8 Classification by investment type and statistics

Different types of investments are considered in the instrument. However, there is a discrepancy between the numbers taken from the legal texts and reports on the one hand and the statistics in the national accounts by the Federal Statistical Office on the other hand. The discrepancy is due to the different statistical definitions of investment and the gradation of public investment activity in the federal system.

1. The investment programs provide information on the federal government's investment expenditure; from a financial statistics perspective, this includes federal investment in tangible assets and federal investment allocations to the public and private sectors. In contrast, national accounts include gross fixed capital formation (GFCF) of local authorities at all federal levels. Accordingly, federal government investment in tangible goods (according to financial statistics) is a subset of gross fixed capital formation (according to national accounts). There is a small difference in the case of investment in construction, which is recorded in the national accounts according to the progress of construction, while in the financial statistics it is recorded according to the actual time of disbursement. However, in the case of installment payments, this may also correlate with the progress of construction. As a result, our instrument is directly related to a large share of GFCF in the national accounts. In the sample, around 40% of GFCF is carried out by the federal government.

2. Although the states and municipalities can also invest independently, a considerable part of their investment is financed by the federal government in the form investment grants to the states and municipalities. The government finance statistics list the category separately as grants to regional administrative bodies, while the national accounts statistics just count the final investment of the bodies as GFCF. To reflect the national accounts, we incorporate all grants to public regional administrative bodies into the instrument. Thus, the instrument accounts indirectly for about another 40% of total national accounts GFCF.[1] The remaining 20% are invested by states and municipalities independently of federal grants.

[1]This share is probably underestimated since the only data available to us for federal investment grants in the area of public transport and nationwide rail transport is the data for investment grants to Deutsche Bahn. Although Deutsche Bahn has the largest market and investment share in public passenger and freight transportation, regional municipal transportation companies also play an important role.

3. Parts of the investment program expenditures also consist of investment grants to the private sector. These include not only firms that are wholly privately owned, but also public firms and mixed forms. In financial statistics and national accounts, public firms are considered part of the financial or non-financial corporations (except for those institutions that are assigned to the state), as the ownership structure is irrelevant for the sector classification, and are therefore counted as market producers. In the federal budget (financial statistics), however, these investment grants to private companies are in most cases allocated to public investment.

   The ownership of some of these companies has also changed over time (private vs. public).[2] In addition to these prominent examples, there are a large number of public firms, particularly in municipal sectors such as waste collection, water and electricity, local public transport, airport operators, energy suppliers, and municipal housing companies.

   Our instrument captures much of this investment of public firms through investment grants to private firms. In the national accounts, some of this investment is recorded as private investment. Accordingly, an increase in public investment activity, especially in municipalities, is accompanied by a short-term increase in private investment (in public firms) due to the closer integration. This is one explanation for the strong short-term response of private investment.

2.9 Investment programs and budgetary treatment

Most investment programs are managed in the government's core budget. The individual investment projects are reflected in so-called commitment authorizations ('Verpflichtungsermächtigung'). A few investment programs, the German Unity Fund and the Childcare Investment Fund, are

[2] The best known are Deutsche Bahn, Deutsche Telekom, and Deutsche Post. Deutsche Telekom was converted to a stock corporation and privatized in 1994. However, it is still 100 percent owned by the German government. The Federal Ministry of Digital Affairs and Transport (BMDV) is responsible for managing the shares. As part of the Postal and Telecommunications Reorganization Act (Postreform II), Deutsche Bundespost TELEKOM was transformed into a stock corporation named Deutsche Telekom AG effective January 1, 1995, and went public in 1996. The Federal Republic of Germany currently holds 30.5 percent of the shares. As one of the three successor companies to Deutsche Post (Deutsche Telekom AG, Deutsche Post AG, Deutsche Postbank AG), Deutsche Post AG was transformed into a stock corporation in early 1995 as part of Postreform II. Through successful restructuring and targeted acquisitions, the company was made competitive and ready for the stock market and successfully went public in November 2000. The federal government currently holds about 20% of the shares

managed in what is known as an extra budget or special fund ('Sondervermögen'), and are therefore outside of the core budget, that is, stand-alone. The investment program Digital Infrastructure was initially launched as a special fund, but was then transferred to the core budget.

An extra budget is an independent financial budget for specific tasks or institutions. A commitment authorization, on the other hand, is a form of financial planning within the existing budget process. Both forms allow the government to incur financial obligations beyond the current year's budget, without the corresponding expenditure already being specified in the current budget plan. Both must be specific and earmarked and the purpose is defined by law. Therefore, a change of purpose usually requires a legislative decision. This is to ensure that the funds are used only for the specified purpose. Extra-budgetary funds are often financed by specific sources of revenue, such as earmarked taxes, levies or special loans. This could protect them from short-term budget cuts. However, the main reason for setting up an extra budget is to relieve the core budget by outsourcing certain tasks or projects. This can help to make the expenditures of the general core budget appear lower, sometimes an aim of budgetary policy.

For our analysis it makes no difference whether the program is implemented in the core or the extra budget since this is a budgetary peculiarity which is only relevant for practical fiscal policy. In the national accounts and the government finance statistics revenues and expenditures of both the extra and the core budget are included in the overall balance of the general government sector. Thus, they are treated equally.

2.10 Examples of Methodological Application and Classification

To give a better idea of the application of the methodology described above, particularly in terms of categorization, we provide brief examples of how a policy can be categorized into each of the four broad categories of motivations described above.

Example 1: Business cycle stabilization program (endogenous)

Policies introduced over the economic cycle include those aimed at stabilizing employment. These stimulus programs often include investment spending to increase medium-term potential and avoid an abrupt end to government spending. In addition to the problem of reverse causality, sometimes non-investment measures are implemented in parallel to stabilize the economy quickly.

These cannot always be fully dissociated from investment spending. Therefore, business cycle stabilization programs are not included in the instrument and classified as endogenous.

An example is the second economic stimulus package of 2008/2009 during the economic and financial crisis. The German government made a total of 16.9 billion euros available for public investment in 2009 and 2010 to strengthen research and the economy. Additional investment by local authorities and the federal states was supported with €10 billion. In addition, there was a program implemented to strengthen demand for automobiles (€1.5 billion), the central innovation program for SMEs (€900 million), and research funding in the field of mobility (€500 million).

Example 2: Regional disparity program (infrastructure investment, exogenous) Many investment programs aim to support structurally weak regions and increase their growth potential. Although these programs are also linked to economic development, the focus is not on the short-term cyclical stabilization of the economy but on long-term structural development. As a result, there is no direct impact of economic developments on these public investments and we classify them as exogenous.

An example for this type of programs is the Municipal Investment Promotion Act: Infrastructure of 2015. Between 2015 and 2022, the federal government has earmarked a total of 3.5 billion euros for public investment to strengthen the public infrastructure in structurally weak regions. Investment in some parts of the infrastructure (e.g. local roads, public transportation, sports facilities) is actually the responsibility of the states and municipalities, not the federal government. However, Article 104c of the German constitution allows the federal government to provide investment grants to the states and especially to structurally weak municipalities, which are earmarked and can only be used for investments.

Accordingly, these programs have a significantly higher proportion of investment grants from the federal government to the states and municipalities. However, these intergovernmental financial processes do not necessarily mean that material investments at the municipal level financed from federal funds take longer to implement. On the contrary, the funds are often used immediately to finance projects in the pipeline or investment projects that have already been planned but not yet financially approved.

Example 3: Education investment program (education and child care, exogenous) Since the 2000s, a special feature of German investment policy has emerged in the area of investment spending on education. There are two aspects that make it difficult to identify it as an investment program. First, education spending is largely included in government consumption in the national accounts, although it is referred to as "investment" in the public narrative. A good example of this is investment in human capital, which is usually measured in terms of the duration and quality of school and university education. However, it is not only the equipment of the educational institution or the R&D expenditures that play a role here, but also the number of teachers, whose work volume and remuneration are recorded in the government's wages and salaries and are therefore of a consumptive nature. Second, education policy is primarily in the hands of the states, not the federal government. As a result, the federal government's investment spending on university, school, and daycare infrastructure is often recorded as investment grants. Similar to regional investment grants, these are then earmarked intra-governmental transfers that have no impact on the national accounts as such. However, they do have an impact on the national accounts if the subordinate local authority, i.e. the state or municipality, then spends the funds in the form of investments as determined by the federal government. As already described, this process of the federal investment structure does not necessarily mean that there will be delays.

Because of these two aspects, it is relevant for our selection that the programs indicate that construction, such as the expansion of lecture halls or special laboratories, equipment, such as tablets, whiteboards, or funds for research and development will be made, and that the infrastructure of educational institutions will be improved. In order to maintain a narrow definition of investment, we have not included funds used to increase the number of teachers, although this is related to the economic concept of human capital. A large part of the programs are investment grants from the federal government, as can be seen from the fact that a special federal-state pact was concluded in the area of universities, for example, in order to jointly improve the university infrastructure.

The Higher Education Pact I, for example, had two goals. First, the performance of the university was to be increased, with performance measured specifically by the number of students. The increase in the number of students is accompanied by construction measures for additional lecture halls and classrooms, laboratories, canteens, and student housing. The second objective explicitly addresses the quality of teaching. In particular, the use of digital media has increased. This involved equipping lecture halls with whiteboards, networks and other digital investments. Both of these expenditures are capital expenditures. Information on the investment funds is published in the draft legislation so that the investment funds can be distinguished from other funds in the course of the program. Although some funds have likely been used in parallel for consumption, there is no mention in the legislative texts of a large-scale increase in the number of teachers or an adjustment in salaries. As a result, we have classified the program as an investment, and since it is not influenced by current economic developments and pursues more structural goals that promote potential output, we have included it in our instrument (classified as exogenous).

Example 4: Modernization program (infrastructure investment, exogenous)
Further examples are programs to promote technological capability and thus expand economic capacity and potential output. Over the years, these programs have focused on key future technologies that modernize and improve Germany's infrastructure, such as telecommunications and broadband expansion, environmentally-friendly and energy-efficient expansion in the areas of housing and mobility, and digitization.

An example of this is the program for future investments, including in particular the improvement of environmentally friendly infrastructure and the improvement of transportation. The regulation focuses on longer-term growth and structural aspects. Economic stabilization and employment policy goals are not mentioned. The total investment funds of the federal government are given as DM (Deutsche Mark) 8.2 billion for 5 years. In addition, the investment funds of the federal states (DM 3.4 billion) and the municipalities (DM 2.1 billion) are listed.

Examples 2-4 are classified as exogenous. A further categorization can be made according to whether the programs contain a relevant share of public investment grants for private investment.

Example 5: investment grants to private households and firms (exogenous)
Of all the programs considered (exogenous and endogenous), some provide direct investment grants to households and firms. Private investment grants are often included in stimulus packages and frequently introduced during economic downturns. We classify them as endogenous investment

programs but with two exceptions: the two investment programs aimed at energy-efficiency renovations, which are not focused on economic stabilization but on raising construction investment generally to modernize buildings.

3 Narrative Analysis of Federal Government Investment Programs

We construct the following list of government investment programs of the German federal state between 1970 and 2018. The list includes all investment programs that we detect in the documents. For the instrument, we select only those from the list that meet our criteria for inclusion in the instrument series.

3.1 Second Stability Program (Zweites Stabilitätsprogramm)

Initial Date	Duration	Series	Type	Amount (total, in €)
9th May 1973	2 years	2Q1973 – 4Q1974	endogenous	-4.2 bn

Type of program: Business cycle stabilization program

Type of investments: Investment grants, investment tax in order to reduce high inflation due to an increasing oil price, investment grants to private.

Short description: A strong economic upswing and the renewed acceleration of the inflationary trend have put the economy in a situation in which the stabilization policies appear to be inadequate. In this situation, the federal government adopted a second stability program which, in conjunction with monetary and credit policy measures as well as a series of additional tax policy measures, e.g. suspension of special depreciation allowances for new investments, levying of an investment tax for a maximum period of two years for new investments, the reduction of investment allowances pursuant to the Investment Allowance Act by one-fourth.

The law of 22.05.1973 states that an expert report by the German Council of Economic Experts came to the clear conclusion that "*...a steep economic upswing and the renewed acceleration of inflationary developments had brought the economy into a situation in which the stabilization policy appeared to be inadequate...*" The background to the program is therefore in particular the accelerated inflationary development and thus the economic situation.

This situation prompted the federal government to adopt a second stability program on May 9, 1973, which, together with monetary and credit policy measures, budgetary policy measures, trade policy measures and competition and consumer policy measures, also included a series of far-reaching and additional tax policy measures, the main points of which are reported here.

The aim of the program is as follows: *"...The main aim of the program is to dampen demand for capital goods. The planned measures (investment tax, abolition of the declining balance depreciation for movable assets, abolition of § 7 para. 5 EStG and suspension of § 7 b EStG) must be considered as a whole; together with the restrictive course of the German Bundesbank, these measures would restrict investment activity, which - admittedly only in a few months - could lead to a trend reversal in price development..."*

Sources:: Federal Ministry of Finance, Finanzbericht 1973, Bericht des Finanzausschusses (7. Ausschuß).
(`https://dserver.bundestag.de/btd/07/005/0700592.pdf`).

3.2 Program to Promote Employment and Growth with Stability (Programm zur Förderung von Beschäftigung und Wachstum bei Stabilität)

Initial Date	Duration	Series	Type	Amount (total, in €)
6th February 1974	1 year	1Q1974 – 4Q1974	endogenous	4.0 bn

Type of program: Business cycle stabilization program

Type of investments: Public GFC, investment grants, reduction of tax depreciation for investments in order to react to the oil price crisis, investment grants to private.

Short description: The consensus view of all economic observers, including the Council of Experts, was that economic growth in 1974 would be considerably lower than in the previous year, regardless of further economic and financial policy decisions. The employment risks associated with such a slowdown in growth were obvious. The actual extent of the threat to employment in 1974 was seen not only in the context of economic and financial policy measures but also as a result of economic and financial policy decisions. The real extent of the threat to employment in 1974 was not only seen in connection with economic and financial policy measures but was also derived from the possible consequences of price and wage policy decisions by companies and collective bargaining parties. The price stability in 1974 was particularly threatened by the extraordinary rise in the price of crude oil.

According to the Financial Plan 1974 of the Federal Ministry of Finance, *"...German economic and financial policy attempted at an early stage to pave the way for a stable upswing. After a stabilization process had been initiated in 1973 with a consistently restrictive policy by successfully combating the inflationary habit, the federal government took a series of accompanying and supporting measures in 1974 due to the changing economic situation..."* Additionally, the German Council of Economic Experts assessed the program as a response to the economic situation as follows: *"...The German government has reacted flexibly and in appropriate steps to the requirements of the respective economic situation. This was particularly evident in the two targeted special programs of February 6 and September 25, 1974, as well as the broad-based Program for the Promotion of Employment and Growth with Stability..."* In summary, the program can be classified as an economic stimulus program and is therefore endogenous to the current economic situation.

Based on these prospects for overall economic development, the federal government made a series of economic and financial policy decisions. With the "Program to Promote Employment and Growth with Stability" the government promotes investments by medium-sized and and small enterprises, the ERP provides investment grants. New investment allowances are introduced. These are profit-independent investment allowances 7.5 % of the acquisition or production costs. Public GFC in the construction sector are increased by additional federal spending. Furthermore the investments provided for in the 1975 are, as far as possible, postponed to the first half of the year and new investment projects can already be started before the promulgation of the of the 1975 budget law. In order to finance public investment to secure private activity, a part of the reserves accumulated as accounts at the Deutsche Bundesbank will be released namely the funds from the surcharge on income and corporate income and corporation tax (stability surcharge).

Sources: Federal Ministry of Finance, Finanzbericht 1974, German Bundestag 1974. (`https://dserver.bundestag.de/btd/07/041/0704101.pdf`, Federal Ministry of Economic Affairs, Jahreswirtschaftsberichte 1974 und 1975, German Bundestag 1975.
(`https://dserver.bundestag.de/btd/07/016/0701646.pdf`, `https://dserver.bundestag.de/btd/07/031/0703197.pdf`).

3.3 Program for Housing and other Investment (Programm für Bau- und andere Investitionen)

Initial Date	Duration	Series	Type	Amount (total, in €)
27th August 1975	1 year	3Q1975 – 3Q1976	endogenous	2.9 bn

Type of program: Business cycle stimulus program

Type of investments: Public infrastructure GFC.

Short description:

In its fiscal policy decisions in mid-1975, the federal government was faced with a dual task: in the short term, additional expenditures were needed to expand public demand; in the medium term, interventions were needed, especially on the expenditure side of the budget, to reduce the high financing deficits. The federal government wrote about this in its 1975 financial plan:

"...A supplement to the 1975 Federal Budget took account of the changes in the 1975 budget

caused by the recessionary development in such a way that the additional expenditure which became necessary and the revenue shortfalls - mainly due to the economic situation - were covered by an increase in net borrowing of DM 15.15 billion".

A program of DM 5.75 billion (including DM 3.15 billion from the federal government) to strengthen construction and other investments is intended to reduce employment risks, particularly in the construction industry, and at the same time to improve the domestic economic conditions for a recovery in production and employment..."

It is not entirely clear from these statements whether the program is an economic stimulus program, as the government deliberately communicates the dichotomy (short-term/demand-side vs. medium-term/supply-side). However, the indication that the government wants to reduce employment risks, especially in the construction sector, and motivate a recovery in production points more to economic stabilization and thus to the endogeneity of the program.

The German government's intention then becomes clearer in the more detailed description of the program. Here it emphasizes that the global recession can only be overcome through joint efforts by the industrialized countries. *"...The German government has therefore been working hard for some time now to implement concerted international measures to stimulate the economy. With this in mind, the countries of the European Community have agreed to undertake coordinated action to support the economy and improve the longer-term prospects for growth and stability. Part of this effort is the German government's program to strengthen construction and other investments...."*

The program mainly covers municipal infrastructure and urban redevelopment, federal investments and housing modernization. The program is funded in varying proportions by the federal government (60%), states (26%), and municipalities (14%).

Although the federal government is pursuing medium-term goals with the program, the intent and reason for the program is a response to the current economic situation. Stimulus programs often include capital spending or medium-term targets to smooth the economic effects of the program over time. In summary, we classify the program as a stimulus program and thus as endogenous.

Sources: Federal Ministry of Finance, Finanzbericht 1976.
(https://dserver.bundestag.de/btd/07/041/0704101.pdf)

3.4 Program for Future Investments (Programm für Zukunftsinvestitionen)

Initial Date	Duration	Series	Type	Amount (total, in €)
23rd March 1977	5 years	1Q1977 – 4Q1981	exogenous	6.7 bn

Type of program: Modernization program

Type of investments: Increase of public infrastructure GFC (water infrastructure, mobility, energy, housing) in order to reach environmental criteria and long-term growth stimulation.

Short description: According to the Annual Economic Report 1977 and 1978, the federal government attaches great importance to the expansion of public infrastructure. Both the necessary improvement in the conditions for growth and employment and the expansion of an environmentally friendly infrastructure require not only increased private investment but also considerable public investment in the coming years. The federal government therefore considers a multi-year program for growth and environmental policy to be necessary, with additional investment spending by local authorities. The program has been prepared together with the federal states and municipalities. It was focused on forward-looking projects in key areas such as water management, traffic safety, the living environment and energy supply.

The Financial Report also states that the federal government's objective is to secure long-term economic growth through improved infrastructure and more favorable environmental conditions, to facilitate economic structural change and at the same time to help restore a high level of employment. In accordance with the objective and the financial framework of the program, the measures focus on the following areas:

Improvement of the transportation system (95% federal government funding, including the elimination of railroad crossings, elimination of accident black spots on the federal highway network, construction of bypasses, highway connections, research projects (including communications technology), rational and environmentally friendly use of energy (72% federal government funding, including in particular the expansion of the district heating supply), future water management (42% government federal funding, including in particular the Rhine-Lake Constance program, wastewater disposal, erosion and flood protection, coastal protection), and improvement of the living environment (40% federal government funding, including infrastructure measures in inner city areas, infrastructure measures in priority locations for joint tasks, village renewal).

The Regulation Statement foregrounds the longer term, growth and structural political aspect of the program. Business cycle stabilization and employment policy goals are not seen as being particularly topical or even as having priority. The federal government has earmarked DM 8.2 bn for its own share. The states (DM 3.4 bn) and the municipalities (DM 2.1 bn) are less burdened than the federal government with a total of DM 5 bn.

Due to its clear focus on the structural improvement of the German economic infrastructure, this program is classified as a modernization program. As stated by the German government and external sources such as the German Council of Economic Experts, the ultimate target of this program is to increase production capacity and potential output.

Sources: Federal Ministry of Finance, Finanzbericht 1978, Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 1977 und 1978, Wirtschaftsdienst. (https://dserver.bundestag.de/btd/08/009/0800951.pdf, https://dserver.bundestag.de/btd/08/000/0800072.pdf, https://dserver.bundestag.de/btd/08/014/0801471.pdf, https://www.econstor.eu/bitstream/10419/135099/1/wd_v57_i08_pp391-398.pdf).

3.5 Program to Promote of Growth and Employment (Beschlüsse der Bundesregierung zur Förderung von Wirtschaftswachstum und Beschäftigung)

Initial Date	Duration	Series	Type	Amount (total, in €)
14th September 1977	1 year	3Q1977 – 4Q1978	endogenous	2.7 bn

Type of program: Business cycle stabilization program

Type of investments: Investment grants, depreciation allowances in order to stimulate the weak economy, investment grants to private.

Short description: In its financial report, the German government writes with reference to the program for future investments that a number of measures have already been taken to promote economic growth in the year to date. However, it points out that these measures are on the supply side and that the economic situation now calls for measures to stimulate overall economic demand and thus counteract unemployment in particular. In the current situation, it would be important to stimulate consumer demand by increasing mass purchasing power sufficiently without imposing additional costs on the economy and to strengthen the economy's willingness to invest by reducing investment risks. For this reason, the German government initiated measures to support the economy. The measures are of a short-term nature and are being implemented by the federal government with the aim of stabilizing the economy.

Sources: Federal Ministry of Finance Finanzbericht 1979.
(https://dserver.bundestag.de/btd/08/009/0800951.pdf, https://dserver.bundestag.de/btd/08/009/0800900.pdf)

Initial Date	Duration	Series	Type	Amount (total, in €)
1st July 1978	4 years	2Q1978 – 4Q1982 (repeatedly ext.)	exogenous	2.2 bn Euro

3.6 Program to Promote Energy-Saving Investments (Programm zur Förderung heiz- und energiesparender Investitionen)

Type of program: Modernization program

Type of investments: Investment grants for energy-saving housing and infrastructure, public housing GFC in states and municipalities.

Short description:

In the wake of two oil-price crises and the public's increasing demands for environmental protection, the German government has confirmed the basic direction of its energy policy with the second update of its energy program. The focus is on a comprehensive program for the rational and economical use of energy, which also makes a significant contribution to environmental protection, as well as on further increasing the security of energy supply while taking into account macroeconomic necessities. Long-term risks, in particular due to foreseeable developments in the world oil markets, remain unchanged.

Both the government and the opposition agreed that the supply of sufficient and secure energy at affordable prices is crucial for Germany's future development. The competitiveness of goods on the world and domestic markets, and thus job security, depend on the solution of the energy question, as do social security and the financial leeway for distribution provided by economic growth. It is therefore essential to reduce dependence on energy imports. There is general agreement that the rational and economical use of energy must be an essential element of energy policy.

In 1982, a report presented the status and results of measures for the rational use of energy. These measures included in particular the Program but also other individual measures that were subsequently adopted. The results were also to be used for possible adjustments in the continuation of the program. In the report on the continuation of the program, the German government writes: "In the third update of the energy program (Bundestag document 9/983 of November 5, 1981), the German government has taken this initial situation into account. It has set out how it intends to support and continue the process of adapting the German economy to the changed global energy situation in the coming years. The focus is on the economical and rational use of energy and the substitution of oil, as well as the securing of a sufficient energy supply at internationally comparable prices and conditions".

With this program the federal and state governments promote housing modernization to improve the supply of good, affordable housing for broad segments of the population, thereby helping to preserve cities and communities. Modernization is the improvement of housing through structural measures that sustainably increase the utility value of the dwelling or permanently improve housing conditions. Unless otherwise specified, federal financial assistance is made available between the federal government and the states. To promote energy-saving measures, the federal government grants the states financial assistance. The program was permanently extended and still exists.

Due to the primary objective of securing energy supply in the medium to long term, we classify the program as a modernization program, especially because of the focus on environmental protection and more efficient energy supply. To ensure the long-term competitiveness of the economy, the program is not directly related to the current economic situation and is therefore considered exogenous.

Sources: Federal Ministry of Finance, Finanzbericht 1979, Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 1978, Gesetzesentwurf Bundestag. (`https://dserver.bundestag.de/btd/09/019/0901953.pdf`, `https://dserver.bundestag.de/btd/08/017/0801782.pdf` `https://dserver.bundestag.de/btd/08/017/0801782.pdf`, `https://dserver.bundestag.de/btd/09/003/0900319.pdf`, `https://dserver.bundestag.de/btd/09/019/0901953.pdf`).

Initial Date	Duration	Series	Type	Amount (total, in €)
29th December 1984	1 year	4Q1984 – 4Q1985	endogenous	0.3 bn

3.7 Federal Aid Program for Investments in Saarland (Finanzhilfen des Bundes an das Saarland für bedeutsame Investitionen)

Type of program: (Regional) business cycle stabilization program

Type of investments: Investment grants, public infrastructure GFC in municipalities, investment grants to private.

Short description: The law describes the main reason for the federal investment funds: "As the smallest territorial state, Saarland has particularly serious structural problems compared to other German states. Its economic strength still suffers from the historical economic underperformance and is also affected by the crisis in the important coal mining and iron and steel industries."

For this reason, the federal government had granted the Saarland for the years 1985 to 1987 for particularly important investments to strengthen significant investments to strengthen economic power. The federal government grants financial assistance to the Saarland for particularly significant investments to improve transport infrastructure, measures to create new jobs to replace structural job losses in the steel industry, other measures to improve infrastructure, in particular to open up new business areas.

Despite the structural orientation of the program, we have decided to classify it as endogenous because, as described above, the Saarland was experiencing an acute economic crisis at the time. Thus, although the program does not directly address the objective of stabilizing the economy, it is a direct consequence of the bad economic state.

Sources: Federal Ministry of Finance, Finanzbericht 1985, German Bundestag. (`https://dserver.bundestag.de/brd/1984/D576+84.pdf`)

3.8 Balancing Economic Disparities Act (Gesetz zum Ausgleich unterschiedlicher Wirtschaftskraft in den Ländern)

Initial Date	Duration	Series	Type	Amount (total, in €)
07th November 1988	10 years	1Q1989–4Q1998	exogenous	12.3 bn

Type of program: Regional disparity program

Type of investments: Public GFC, financial aid of the federal government to states and municipalities for specific investment purposes.

Short description: In the draft of a law to equalize different economic power in the federal states: *"...The economic development in the Federal Republic of Germany has been characterized by sustained growth for years. However, the development varies from sector to sector and from region to region. The task of achieving regionally balanced economic development is primarily the responsibility of the federal states. Financial support from the federal government can help to reduce the divergence in future growth opportunities and prospects between the individual regions.*

Furthermore, according to the German government, *"...there are many reasons for this development. Sectors that were leading industrial areas and drivers of growth in the past are having to adapt to changing technological developments and changing demand conditions at home and on the global markets. Even today, some of these traditional sectors are still facing the problems of a considerable reduction in capacity and employment. On the other hand, there are sectors of the economy that often achieve higher growth rates and create additional jobs on the basis of modern technologies and stronger demand - in some cases after coping with adjustment processes. These include, for example, the service sectors and the electrical industry. Structural change is an important element and the basis for economic growth in the Federal Republic of Germany. Structural change is characterized by differentiated development in the regions and economic sectors, also as a result of political decisions in individual countries..."*

It also defines the procedure: *"...In order to compensate for differences in economic strength,* *the grants for a period of ten years starting in 1989 for particularly important investments by the states and municipalities totaling DM 2.45 billion per year. The present bill will result in federal expenditures under the federal government under the Structural Assistance Act for the years 1989 to end of 1998 in total of DM 24.5 billion..."* The states and municipalities will bear at least 10% of the public financing of the investments, i.a. to modernize the economic infrastructure, especially traffic, waste management and other development of the environment, promote education and training in the vocational sector, including the universities, R&D investments, urban planning.

The program is designed to reduce regional disparities. It is not targeted at individual states experiencing a current economic emergency, but supports all states to varying degrees, given their different economic structures. The program is also designed for the long term, for 10 years. In 1988, the German economy grew by 3.4 percent in real terms, and this growth was fairly homogeneous across the states. Therefore, from an economic point of view, there was no need for a program to stabilize the economy. Accordingly, the program can be classified as exogenous.

Sources: Federal Ministry of Finance, Finanzbericht 1989, Finanzbericht 1990, German Bundestag. (`https://dserver.bundestag.de/btd/11/032/1103263.pdf`)

3.9 Economic Resilience Plan (ERP-Wirtschaftshilfe, Investitionen Deutsche Einheit)

Initial Date	Duration	Series	Type	Amount (total, in €)
14th February 1990	2 quarters	1Q1990–2Q1990	exogenous	0.7 bn

Type of program: Modernization/Regional disparity program

Type of investments: Public infrastucture GFC and climate protection investments in the GDR.

Short description: According to the federal government's assessment in the 1990 Annual Economic Report, the economy in the Federal Republic of Germany was in excellent shape at the beginning of 1990: *"...Since the fall of 1982, economic conditions had improved to an extent that was widely considered unattainable at the time. Over the last seven years, the upward trend has been very steady, and growth has recently even accelerated. In 1989, the number of people in employment was higher than ever before in the post-war period..."*

However, the profound changes in Europe following the end of the Cold War had a lasting effect on the German government's policy toward the GDR. The Annual Economic Report states that *"...the Germans in the GDR achieved political change without violence. For the first time in many years, the profound changes in the GDR opened up the possibility of overcoming the division of Germany. Germans on both sides of the border are united by history, language, culture, diverse human relationships, and a sense of belonging to one nation..."* Thus, the federal government deduces from this common basis that it is *"...the task of the Federal Republic of Germany to provide effective support for the necessary reform process in the GDR. Economic policy is of paramount importance in this context. It is a central component of the federal government's German policy within the framework of the ten-point program for overcoming the division of Germany and Europe presented by the Federal Chancellor on 28 November 1989..."*

The federal government sought close cooperation with the GDR in all areas. The aim was to improve living conditions in the GDR as quickly as possible.

- *"...The economic and ecological conditions for successful economic cooperation are to be sustainably improved through joint infrastructure projects, particularly in the areas of transport, telecommunications and environmental protection. Joint commissions have already been formed for these areas.*
- *The federal government is also helping to improve the environment by promoting joint pilot projects which will lead directly to a reduction in environmental pollution in both parts of Germany and can also provide the impetus for the broad application of modern environmental protection technologies on the basis of economic cooperation..."*

To this end, the federal government provided special programs for the GDR at short notice from budget funds within the framework of the ERP assets. The presentation of the supplementary budget is particularly due to the current political developments in the GDR. The supplementary budget primarily serves the purpose of financing the immediate traffic and infrastructure investments that have become necessary.

The funds for investment spending in the GDR are a consequence of unification. Reunification, on the other hand, is to be understood as an exogenous process, as it is due to political and social events that are not directly related to the current economic situation. On the contrary, the current economic situation in Germany did not support an investment program aimed at stabilizing the economy in the short term. The investment programs resulting from unification are thus exogenous, but they have an ambiguous character. First, they are intended to modernize the economic structure of East Germany and increase its potential. Second, they implicitly reduce structural regional disparities, especially between East and West Germany.

Sources: Federal Ministry of Finance, Finanzbericht 1991, German Bundestag, Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 1991,. (`https://dserver.bundestag.de/btd/11/067/1106775.pdf`, `https://dserver.bundestag.de/btd/11/062/1106278.pdf`)

3.10 Investment part "German Unity" fund (Investitionen Fonds "Deutsche Einheit")

Initial Date	Duration	Series	Type	Amount (total, in €)
decided 16th May 1990	4 years	1Q1990–1Q1995	exogenous	10.5 bn (4 bn in 1990)

Type of program: Modernization program

Type of investments: Public infrastucture GFC in the GDR.

Short description: On May 16, 1990, the federal and state governments agreed to create a "German Unity" fund. The financial package was intended to promote economic development and the "reconstruction of the East". For a transitional period until the end of 1994, this money was to be used to promote economic development in the new federal states and the state of Berlin without immediately including them in the usual financial equalization between the old federal states. The equalization of living conditions throughout the Federal Republic was a central promise of the then federal government to the people of the former GDR. The economic policy measures were also aimed at limiting internal migration from East to West Germany after the fall of the Wall.

In particular, the "German Unity" Fund was used to finance the so-called "reconstruction of the East". This was the motto for various measures aimed at strengthening the economy of East Germany and harmonizing living conditions in East and West. These included the renovation and expansion of the road network and the improvement of municipal infrastructure. It also encouraged the construction of commercial and industrial facilities and the renovation of housing. Another goal was to make businesses in the former GDR competitive.

The German Council of Economic Experts also wrote in 1990 that *"...measures to improve the infrastructure (including large parts of the environment) should be given the highest priority in the public funding catalogues for the GDR. Among the many possibilities for support in this area, projects should be selected that are likely to attract private investment if they are not implemented. Since a sustainable improvement of the economic situation in the GDR cannot be expected without this entrepreneurial initiative, the priority of state support for infrastructure investments is justified as a kind of help for self-help...".*

Additionally, in the various reports of the federal government, all the investment programs for promoting German unity repeatedly refer to *"...the need for extensive investment, e.g. in housing and energy supply and for environmentally conscious behavior in the new federal states...". This need stems from the legacy of the former command economy: "...the obsolete, partly already worn out and in many cases almost worthless capital stock due to immense environmental pollution...".* The German government emphasizes in its strategy that the protection of the natural environment is an integral part of the growth objective. *"Adequate economic growth is not only measured by the quantitative expansion of income, production and economic performance. It also includes the qualitative improvement of the natural bases of life and production...".*

The German Council of Economic Experts wrote in a special report: *"In large parts of the GDR, the quality of life is extremely impaired by environmental pollution. Although there was extensive legislation and, since 1972, a constitutional requirement for environmental protection, environmental concerns were not sufficiently taken into account in central economic planning".*

In total expenditures of almost 11 bn Euro (4 bn in 1990) out of 58 bn total funds was used to finance additional public investments already conducted in Q1 (e.g. electricity, traffic and railway system). Mainly investment grants of the federal government to new states and municipalities for infrastructure investment. The additional public investment have the aim of creating the conditions for the aid programs for the accession area laid down and the awarding of contracts for investments during the provisional budget management at the beginning of the year. The commitment appropriations in the government's draft 1990 supplementary budget are intended in particular to measures to promote the economy, in order to rapidly master the convergence process in the new states as quickly as possible.

For similar reasons to the Economic Resilience Plan and the aforementioned objectives of the German government, we classify the investment portion of the "German Unity" Fund as a modernization program and, accordingly, as non-endogenous.

Sources: Federal Ministry of Finance, Finanzbericht 1991, Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 1991, German Council of Economic Advisors, Jahresgutachten 1991 and Sondergutachten. (`https://dserver.bundestag.de/btd/12/010/1201001.pdf`, `https://dserver.bundestag.de/btd/12/002/1200223.pdf`, `https://dserver.bundestag.de/btd/11/084/1108472.pdf`, `https://www.econstor.eu/bitstream/10419/75374/1/75042429X.pdf`)

Initial Date	Duration	Series	Type	Amount (total, in €)
29th October 1990	2 quarter	3Q1990–4Q1990	exogenous	1.15 bn

3.11 Extension of the German Reunification Funds (Aufstockung des Fonds Deutsche Einheit, Dritter Nachtragshaushalt)

Type of program: Modernization program

Type of investments: Public infrastucture GFC in the GDR.

Short description: The presentation of the Third Supplementary Budget 1990 by the federal government became necessary following the completion of German unification in order to merge the 1990 federal budget with the previous 1990 GDR sub-budget and to take account of the financial effects of the Unification Treaty of August 31, 1990. The Third Supplementary Budget 1990 takes into account in particular the additional financial requirements that have arisen following an initial assessment of the situation in the accession territory. Furthermore, the budgetary basis is created for the measures provided for in Article 28 of the Unification Treaty to accelerate economic growth and structural change in the accession area.

The supplementary draft provides for an increase in commitment appropriations, among other things to ensure the awarding of contracts for investments during the provisional budget management at the beginning of the year. The commitment appropriations set out in the government draft of the third supplementary budget for 1990 are dedicated in particular to measures to promote the economy in order to quickly cope with the conversion process in the accession area. This includes, among other things, the promotion of municipal investment in fixed assets and modernization. In addition, the volume of the joint task "Promotion of the regional economic structure" will be increased between 1991 and 1995, half of which will be financed by the federal government and the federal states.

For the reasons mentioned above, we consider the additional investment spending to be part of the modernization program for the East German economy.

Sources: BMF Finanzbericht 1991, German Bundestag. (`https://dserver.bundestag.de/btd/11/081/1108160.pdf`)

3.12 Extension of German Reunification Funds (Aufstockung des Fonds Deutsche Einheit)

Initial Date	Duration	Series	Type	Amount (total, in €)
27th November 1991	3 years	1Q1992–1Q1995	exogenous	5.5 bn Euro

Type of program: Regional disparity program

Type of investments: Mainly investment grants of the federal government to new states and municipalities for infrastructure investment.

Short description: The Structural Aid Act provides that the federal government will grant the former West German states, with the exception of Hesse and Baden-Württemberg, financial aid for investments to compensate for differences in economic strength for a period of ten years from 1989. The original concept of the Structural Aid Act has become obsolete in view of the considerable structural problems in the new states as a result of German unification. A continuation of structural aid to the old states after January 1, 1992 would not be in line with the fiscal constitution because of the great structural disparity with the new states. For these reasons, the Structural Aid Act will be repealed at the end of 1991. The law already contains a revision clause according to which the distribution of financial aid among the states is to be adjusted to developments as of January 1, 1992.

Further improvement in the financial resources of the states and their municipalities in the years 1992 to 1994; Avoidance of federal support measures in favor of the old states, which, after German unification, would be in conflict with the structural problems of the new states, are no longer consistent with the constitution. Increase the German Reunification Fund by the current total volume of financial aid for investments (DM 2.45 bn per year) by means of corresponding federal payments to the fund in the years 1992 to 1994. Further increase of the German Reunification Fund in the years 1992 to 1994 through additional federal payments of DM 3.45 bn.

According to the draft law, *"...at least DM 2.45 billion of the total annual payments from the fund are to be used for investment purposes in the new states and their municipalities from 1992 onwards..."*

In contrast to the previous investment programs in the course of German unification, this program is aimed at structural equalization, i.e. the reduction of regional disparities. Accordingly, it is still to be classified as a program that is not directly affected by the current economic situation and is therefore exogenous.

Sources: Federal Ministry of Finance, Finanzbericht 1992, Finanzbericht 1993, German Bundestag.
(https://dserver.bundestag.de/btd/12/012/1201227.pdf)
(https://dserver.bundestag.de/brd/1992/D101+92.pdf)

3.13 Housing Investment Program ("Programm Gebäudesanierung")

Initial Date	Duration	Series	Type	Amount (total, in €)
1st February 2006	4 years	1Q2006–4Q2009	exogenous	5.9 bn

Type of program: Modernization program

Type of investments: Public building GFC and investment grants for housing, investment grants to private.

Short description: The CO2 building renovation program, the purpose of which is to increase energy efficiency. According to the federal government, this is an important environmental and economic policy measure. From 2006 to 2009, the German government will provide a total of €1.4 billion per year for the promotion of energy-efficient building refurbishment (including the refurbishment of federal buildings) and will also provide direct grants in addition to the existing loan support under the KfW CO2 Building Renovation Program.

An assessment by the Bundestag provides some details of the investment program for federal properties alone; other public buildings owned by the federal states and municipalities were also renovated. For example, the "Energy Saving Program for Federal Properties" provided 360 million euros for the energy-efficient refurbishment of civilian and military buildings from 2006 to 2008. By September 2007, around 1,100 applications for 377 million had been approved, writes the federal government in its answer to a minor question from Bündnis 90/Die Grünen. A further 350 applications for around 250 million euros have been submitted for preliminary examination and approval. This includes earmarks for measures of the Prussian Palaces and Gardens Foundation amounting to 20 million euros, for the Karlsruhe and Jülich research centers with 48 million euros and for the Federal Constitutional Court in Karlsruhe with 10 million euros. According to the federal government, the energy refurbishment measures are broken down as follows: 48 percent of the funds were spent on building physics measures such as insulation, 47 percent on energy supply and building technology measures such as lighting, heat generation and distribution and the use of renewable energies. According to the federal government, the energy-efficient refurbishment of federal buildings is expected to save 380 million kilowatt hours of electricity and reduce carbon dioxide emissions by 114 million kilograms. According to a calculation by the German Energy Agency (DENA) for the years 2003 to 2005, the specific heat consumption in government buildings is between 54 and 107 kilowatt hours per square meter and year, and the specific electricity consumption is between 31 and 97 kilowatt hours. In the program for the energy-efficient refurbishment of federal buildings, 120 million euros will be made available each year from 2006 to 2009 for energy-saving measures. Due to the high proportion of military properties, 50 percent of this will go to the Ministry of Defense.

Due to the goal of increasing the energy efficiency of public buildings and thus making Germany less dependent on fossil fuels in the medium term, we consider the programm to be a modernization programm.

Sources: Federal Ministry of Finance, Finanzbericht 2007, German Bundestag. (https://dserver.bundestag.de/btp/16/16014.pdf, https://webarchiv.bundestag.de/archive/2008/0506/aktuell/hib/2008/2008_097/02.html)

3.14 Excellence Initiative ("Exzellenzinitiative")

Initial Date	Duration	Series	Type	Amount (total, in €)
13rd October 2006	11 years	3Q2006–4Q2017	exogenous	4.6 bn

Type of program: Education investment program

Type of investments: R&D investments and R&D grants, building & equipment GFC.

Short description: In addition to the classic investment programs launched in the 1970s and 1980s to stabilize the economy and the modernization programs launched in the 1990s in the wake of German reunification, the 2000s were characterized by investment programs to strengthen education and research and development. In its annual report on research and development, the German government writes: *"...Expenditure on research and development (R&D) is embedded in a broader framework of expenditures that together can be regarded as investments in the future. This includes spending on science. Science expenditure includes R&D expenditure as well as expenditure on scientific education and other related scientific activities such as scientific and technical information services, data collection for general purposes or feasibility studies for technical projects..."*

However, there were concerns that Germany was increasingly losing ground in international R&D competition. In its 2006 Annual Economic Report, the German government writes: *"...In 2004, the share of R&D expenditures in Germany's gross domestic product (R&D intensity) reached 2.5 percent. This puts Germany's R&D intensity above the EU average of 1.9 percent. Nevertheless, Germany's private and public R&D capacities have developed below average in absolute terms since the early 1990s, even in an EU and OECD comparison. In terms of the share of researchers in the labor force, Germany has fallen far behind important competitor countries. Germany's success in international technology competition, which is reflected in patent* *applications and export shares for technology goods, is due to the high efficiency of the German research system. Germany needs to catch up in terms of investment in research and development (R&D)...*

This is why the German government emphasizes the reasons for launching the Excellence Initiative: *"...universities are the foundation of the science system. Their research results form the basis for innovation.The Initiative for Excellence, which is jointly funded by the federal government and the states to strengthen university research, is being consistently implemented. Graduate schools, clusters of excellence and future concepts for cutting-edge university research will receive a total of €1.9 billion in funding through 2011...*

The government will strengthen the promotion of cutting-edge technologies and increasing the attractiveness of Germany as a research location. In order to strengthen excellence in research at universities and their networking with non-university institutions and the economy, the funding program "Excellence Initiative for the Promotion of Science and Research at German Universities" Future concepts for the expansion of top research, graduate schools and clusters of excellence are funded on a competitive basis. Of the total annual 380 million, the federal government will provide 75 percent. The program has a total volume of €1.9 billion until 2011, with joint financing by the federal and state governments. The Excellence Initiative offers German universities the opportunity to sharpen their profiles and to become centers of excellence with high international appeal. In June 2009, the continuation of the initiative until 2017 and an increase in funding by 30% to a total of funding by €2.7 billion was decided. In 2012, approximately €308 million has been earmarked from the federal budget for the Excellence Initiative.

The Excellence Initiative has been extended until 2017, as the German government writes in its 2011 financial plan: *"...The Excellence Initiative, another joint program of the federal and state governments, gives German universities the opportunity to sharpen their profiles and create centers of excellence with high international appeal. A total of 85 institutions at 37 universities are currently being funded: 39 graduate schools to promote young academics, 37 clusters of excellence to promote cutting-edge research and 9 institutional strategies to establish universities* *as top international institutions. In June 2009, it was decided to continue the Excellence Initiative until 2017 and to increase funding by 30% to a total of € 2.7 billion. In 2012, around € 308 million has been earmarked from the federal budget for the Excellence Initiative...* The additional funds for R&D will primarily be used for research measures to promote innovation and growth, which should lead to more employment in Germany and have a leverage effect on additional R&D investments by industry and the federal states.

The case of the Excellence Initiative is an example of an investment program, especially for R&D investments, which consists mainly of federal subsidies. However, these grants are earmarked for the lower level of the state as a whole, i.e. the federal states, which use these funds to expand the research infrastructure at the universities. This funding structure is necessary because the federal government is not allowed to invest directly in the university research system, as higher education policy is the responsibility of the federal states. With the clear focus of the investment program on research infrastructure, the federal government aims to strengthen Germany's long-term production potential and competitiveness. The program is therefore assigned to the sub-category of education investment programs.

Sources: Federal Ministry of Finance, Finanzbericht 2007, German Bundestag. Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 2006. (`https://dserver.bundestag.de/btd/16/007/1600751.pdf` `https://dserver.bundestag.de/btd/17/066/1706601.pdf`), `https://www.bundesregierung.de/resource/blob/975918/779186/51fb5020327e09defc7187c24bb329f7/2006-01-25-jahreswirtschaftsbericht-2006-data.pdf?download=1`)

3.15 University Package I ("Hochschulpakt I")

Initial Date	Duration	Series	Type	Amount (total, in €)
14th June 2007	3 years	3Q2007–2Q2010	exogenous	1.2 bn

Type of program: Education investment program

Type of investments: R&D investments and R&D grants, building & equipment GFC, education infrastructure grants for federal states and municipalities.

Short description:

In its Jahreswirtschaftsbericht 2007 the federal government states: *"...Against the backdrop of demographic change and the increasing demand for skilled workers, the Higher Education Pact 2020, which was signed by the German federal and state governments in the summer of 2007, aims to ensure that the younger generation has access to higher education, to secure the necessary number of young academics, and to further strengthen the international competitiveness of German research..."*

In view of forecasts of a temporary sharp rise in demand for demand for university places, the federal and the federal states have concluded the Higher Education Pact. The federal government is providing a total of 565 million euros by 2010, with the states providing the overall overall funding. The federal government is also strengthening research: Projects that are funded by the German Research Foundation (DFG) receive an additional receive compensation for the indirect costs of the project in the amount of the indirect costs incurred by the project in the amount of 20% of the funding sum. In total, the German government will provide around 700 million euros for this purpose.

The Higher Education Pact provided a significant amount of funding for the structural and technical infrastructure of the universities. This included new buildings, renovations and equipment with modern technology to adequately teach the increased number of students. Additional funds were made available for the recruitment of faculty to cope with the increased number of students. This included professorships as well as academic and non-academic staff. In addition, investments in digital infrastructure and digital teaching and learning formats were funded to make universities fit for the demands of the digital age. In summary, the Higher Education Pact aimed to expand and improve the capacity of universities to cope with the increasing number of students, while at the same time ensuring and improving the quality of teaching and study conditions.

Even though the goal of capacity expansion and modernization could argue in favor of classifying this investment program as a modernization program, we classify it as an education investment program due to its specific character and the relatively high proportion of R&D investments.

Sources: Federal Ministry of Finance, Finanzbericht 2008, German Bundestag. (`https://dserver.bundestag.de/btd/16/092/1609260.pdf`)

3.16 Childcare Investment Funds ("Sondervermögen Kinderbetreuungsaufbau")

Initial Date	Duration	Series	Type	Amount (total, in €)
22nd December 2007	7 years	4Q2007–4Q2014	exogenous	4.7 bn

Type of program: Education investment program

Type of investments: building GFC, investment grants for childcare infrastructure to federal states and municipalities.

Short description: In the draft law on the establishment of a special fund for the expansion of childcare, the federal government describes the current situation in childcare as follows *"...There is a considerable shortage of childcare places for children under the age of three in Germany, with considerable differences between the states despite the undisputed need, which has not been eliminated despite the efforts of recent years. The federal and state governments agree that a national average supply rate of 35% is needed to meet demand. Based on the expansion level for 2010 in accordance with the Daycare Expansion Act, an additional 300,000 places will have to be created by 2013, which will require considerable financial investment. For this reason, the federal government will set up a special fund for the expansion of childcare in 2007, which will enable the federal government to finance the necessary investments in a visible manner throughout Germany..."*

It also points out in detail that the expansion of the early childhood care infrastructure is an urgent public task: *...The current supply of childcare places for children under the age of three is inadequate compared to demand. A joint financial effort by all levels of government is needed to make up the shortfall. The federal government is therefore making 2.15 billion euros available in* *the short term for the expansion of childcare for young children. [...] The special fund will provide financial support for investments to expand the childcare infrastructure. The legal basis for this will be Article 104b of the Basic Law. The funds are to be used to support particularly important investments that are necessary to improve the structural conditions for economic development in Germany and thus to promote economic growth..."*

In specific, the provision of the entire 2007 will give local authorities and citizens the confidence they need to expand childcare for immediate expansion. Investments to expand childcare, 2.15 bn by 2013, in 2013 another 1.85 for entitlement to childcare place and 770 million annually in 2014.

The program is included in the education investment programs also because, similar to the other education investment programs, it consists mainly of federal grants to the states and municipalities earmarked for investments in kindergarten infrastructure. As a result of the intergovernmental transfers, public investments (mainly construction investments) are triggered at the state and municipal levels. This program also overlaps with investment programs for modernization and capacity expansion, first because early childhood education increases future human capital, and second because better childcare already increases the current labor supply of parents, especially mothers.

Sources: Federal Ministry of Finance, Finanzbericht 2008, Finanzbericht 2013, German Bundestag.
(`https://dserver.bundestag.de/btd/16/065/1606596.pdf`)

3.17 Stimulus Package I ("Konjunkturpaket I")

Initial Date	Duration	Series	Type	Amount (total, in €)
05th November 2008	1 year	4Q2008–4Q2009	endogenous	8 bn

Type of program: Business cycle stabilization program

Type of investments: Machinery and R&D GFC, investment grants to private.

Short description: In response to a major question in the Bundestag on the impact of the 2008/2009 investment measures, the federal government describes the causes and objectives of the package of measures: *...In the worst economic crisis since the Federal Republic of Germany was founded, the federal government has supported the economy. Two economic stimulus packages were introduced in Germany at the end of 2008 and the beginning of 2009 respectively - in addition to support measures to stabilize the financial markets, various measures were introduced in Germany at the end of 2008 and the beginning of 2009, to actively counteract the massive economic slump: In November 2008, the Economic Stimulus Package I was launched in November 2008. The measures adopted at the end of 2008 to the beginning of 2009 to stabilize growth and employment represent a mix of different instruments which flow into the economic cycle at different points: Additional- government spending on investment in the transport and construction sectors and on the and construction as well as the Future Investment Act stimulate macroeconomic activity. Companies' willingness to invest will be boosted by the improved tax deductibility of investments, which is limited until the end of 2010...*

The federal government reacts to the measures: *....The measures adopted between late 2008 and early 2009 to stabilize growth and employment represent a mix of different instruments that will be introduced at different points in the economic cycle: Additional government spending on investment in the transport and construction sectors and as part of the Investment for the Future Act is stimulating overall economic activity. The disposable income of private households will be boosted by income tax cuts, the improved deductibility of tradesmen's services, the increase in the standard child benefit and child allowance, and the reduction in the contribution rate to statutory health insurance, among other things. By improving short-time work, the federal government has supported employees' and companies' efforts to save jobs during the crisis. All this is stimulating private consumption. The willingness of companies to invest is being boosted by the improved tax deductibility of investments for a limited period until the end of 2010.*

With the "Package of measures to reduce the tax burden, stabilize social security expenditure and invest in families" (Stimulus package I) the federal government has already set a relief framework of government has already agreed a tax relief framework of over € 6 billion in 2009 and almost € 14 billion annually from 2010. Child benefit and child allowance will be increased and further support for families will be introduced. The contribution rate for unemployment insurance will be significantly reduced once again to 2.8% for 2009 and 2010; compared to 2006, when this rate was still 6.5%, this will save citizens and companies around € 30 billion each year. This is a useful addition to the relief provided by the corporate tax reform that came into force in 2008; this will lead to tax relief of € 7 billion in 2009 alone. The development of oil and fuel prices is also having a positive effect at present.

The name "stimulus package" alone classifies the program as an economic stimulus package, and the cause is due to the current economic situation. As a result, the program is endogenous and therefore not considered.

Sources: Federal Ministry of Finance, Finanzbericht 2009, German Bundestag.
(`https://dserver.bundestag.de/btd/17/025/1702568.pdf`)
(`https://www.bundesfinanzministerium.de/Monatsberichte/2001-2016/Inhalte/Monatsbericht` `2008/Monatsbericht_Nov_2008.pdf?__blob=publicationFile&v=4`)

3.18 Stimulus Package II ("Konjunkturpaket II")

Initial Date	Duration	Series	Type	Amount (total, in €)
27th January 2009	2 years	1Q2009–4Q2010	endogenous	14 bn

Type of program: Business cycle stabilization program

Type of investments: Machinery, building and R&D GFC, investment grants, investment grants to private.

Short description: In response to a major question in the Bundestag on the impact of the 2008/2009 investment measures, the federal government describes the causes and objectives of the package of measures: *...In the worst economic crisis since the Federal Republic of Germany the* *federal government has supported the economy. Two economic stimulus packages were introduced in Germany at the end of 2008 and the beginning of 2009 respectively - in addition to support measures to stabilize the financial markets, various measures were introduced in Germany at the end of 2008 and the beginning of 2009, to actively counteract the massive economic slump: In November 2008, the Economic Stimulus Package I was launched in November 2008. The measures adopted at the end of 2008 to the beginning of 2009 to stabilize growth and employment represent a mix of different instruments which flow into the economic cycle at different points: Additional- government spending on investment in the transport and construction sectors and on the and construction as well as the Future Investment Act stimulate macroeconomic activity. Companies' willingness to invest will be boosted by the improved tax deductibility of investments, which is limited until the end of 2010...*

The federal government is providing a total of 16.9 billion euros for public investment to strengthen research and economic activity. Of this 4 bn euros is earmarked for additional federal investment. With 10 bn euros to support additional investment by local authorities and the federal states. Added to this are the program to strengthen demand for cars (1.5 billion euros), the central innovation program for SMEs (900 million euros) and funding for research in the field of mobility (900 million euros) and funding for research in the field of mobility (500 million euros). These temporary measures will be pooled in a special "Investment and Redemption Fund", which has its own borrowing authority and an effective redemption scheme.

In response to the question about the types of investment activity, the federal government writes: *...Through the special "Investment and Redemption Fund" (ITF), the federal government is making EUR 4 billion available for federal investments to stimulate the economy quickly. Of this amount, EUR 2 billion will be used to rehabilitate, expand and connect transport routes (roads, railways, waterways and combined transport) throughout Germany. In addition, 750 million euros will be used to renovate federal buildings for energy efficiency and 650 million euros will be invested in ministries. Another €500 million will be used to modernize the federal government's information and communications technology (ICT).*

Although the federal government is strongly encouraging investment activity, the primary goal is to stabilize the economy. This is also the answer to the questions *"What structural effects have been achieved by the economic stimulus packages?"* and *"What information does the federal government have on the regional effects of the economic stimulus packages?*: *...The German government currently has no independent and empirically reliable findings on the structural and regional policy effects of the stimulus packages. Nor was it the government's intention to target the stimulus packages at specific regions or sectors. Only the environmental bonus for cars was used specifically to promote the automotive industry, and additional funds were made available to structurally weak regions as part of the program increases in the joint task "Improvement of the Regional Economic Structure" with the first economic stimulus package...*

Similar to the first stimulus package, the follow-up package is also classified as an endogenous stability program due to its strong link to the current economic situation, despite its strong investment focus.

Sources: Federal Ministry of Finance, Finanzbericht 2010, German Bundestag. (`https://dserver.bundestag.de/btd/16/117/1611740.pdf`)

3.19 University Package II ("Hochschulpakt II")

Initial Date	Duration	Series	Type	Amount (total, in €)
13rd March 2011	4 years	1Q2011–4Q2014	exogenous	5.9 bn

Type of program: Education investment program

Type of investments: R&D grants, building & equipment GFC, education infrastructure grants for federal states and municipalities.

Short description: With the "Higher Education Pact 2020", the federal and state governments want to increase the performance of universities. To this end the federal government is granting lump sums to universities for the expansion of of study places. Starting in 2011, it will also support teaching at universities with the "Teaching Quality Pact", it will also support teaching at universities. For the years 2011 to the end of 2015, the federal government has earmarked a total of 5 billion for the expansion of study places and 915 million euros for the Teaching Quality Pact.

The Teaching Quality Pact supported the development and implementation of quality development and assurance measures in teaching. This included the introduction and evaluation of new teaching and learning methods and the establishment of quality management structures at universities. Funding was provided to support innovative teaching projects. This could include the development of new courses or modules, the introduction of practical projects or the integration of digital teaching and learning formats. Part of the funding was used to improve the teaching infrastructure and equipment at universities. This included the development of lecture halls, laboratories, libraries and other facilities necessary for modern and effective teaching. Funds were also provided for the training and qualification of teaching staff to strengthen their pedagogical skills and train them in new teaching and learning methods.

Classification as an educational investment program is analogous to the higher education package I.

Sources: Federal Ministry of Finance, Finanzbericht 2012, German Bundestag. (`https://dserver.bundestag.de/btd/17/076/1707600.pdf`)

3.20 Municipal Investment Fund: Infrastructure ("Kommunalinvestitonsfördergesetz: Infrastruktur")

Initial Date	Duration	Series	Type	Amount (total, in €)
30th June 2015	5 years	2Q2015–4Q2018	exogenous	3.5 bn

Type of program: Regional disparity program

Type of investments: Public infastructure GFC.

Short description: According to the German government's Annual Economic Report 2015, the German economy is facing the challenges of accelerated technological change and an aging society: *"...Innovation and investment in the future are therefore of central importance for Germany. The long period of subdued investment development in certain areas calls for an increase in public investment and an improvement in the framework conditions for private investment. For years, Germany has been experiencing subdued investment activity in certain areas. Significant progress needs to be made in areas such as broadband, transport and municipal infrastructure, as well as in the framework conditions for private investment; further efforts are also needed in education, research and development. Only in this way can Germany remain competitive in the long term and maintain its growth potential..."*

In the Annual Economic Report 2016, the German government then reports in detail on its investment strategy and states that the following measures in particular are being considered to strengthen investment activity in a sustainable manner: *"...the further development of the joint task "Improvement of the Regional Economic Structure" (GRW), the creation of a competence center for the planning and implementation of municipal investment projects as well as the improvement of the legal and institutional framework conditions for private infrastructure financing."*

In the law passed in mid-2015 to promote investment by financially weak municipalities, the German government summarizes the background to the law as follows *"...Although investment by municipalities (local authorities and associations of local authorities) has developed positively overall since 2013, this development is mainly driven by financially strong municipalities in the federal states. In contrast, financially weak municipalities are often unable to finance necessary investments, e.g. for the maintenance, renovation and conversion of local infrastructure. This carries the risk of further entrenching the differences in economic development between structurally strong and structurally weak municipalities and regions. After all, a functioning and efficient infrastructure is a prerequisite for positive economic development....*

To compensate for differences in economic strength across Germany, the federal government supports financially weak municipalities in the states and structurally weak areas in the city states with an investment program for infrastructure. For this purpose, the Municipal Investment Promotion Fund provides financial assistance to the federal states for investments by financially weak municipalities in the states and structurally weak areas in the city states totaling 3.5 billion euros. The purpose of the special fund "Municipal Investment Promotion Fund" is to promote investments of financially weak municipalities.

Because of this clear objective, we rate the program as an investment program to reduce regional disparities. Most of the funds are earmarked investment grants from the federal government to the states and municipalities, which use the funds exclusively for earmarked investments.

Sources: Federal Ministry of Finance, Finanzbericht 2016, German Bundestag, Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 2015, 2016. (https://dserver.bundestag.de/btd/18/046/1804653.pdf, https://www.bmwk.de/Redaktion/DE/Publikationen/Wirtschaft/jahreswirtschaftsbericht-2015.pdf?__blob=publicationFile&v=1, https://www.bmwk.de/Redaktion/DE/Downloads/J-L/jahreswirtschaftsbericht-2016.pdf?__blob=publicationFil v=1, https://dserver.bundestag.de/btd/18/055/1805501.pdf)

3.21 Municipal Investment Fund: Schools ("Kommunalinvestitonsfördergesetz: Schulen")

Initial Date	Duration	Series	Type	Amount (total, in €)
30th June 2015	8 years	2Q2015–4Q2022	exogenous	3.5 bn

Type of program: Education investment program

Type of investments: school building & equipment GFC, school infrastructure grants for federal states and municipalities.

Short description: In the Act on the Promotion of Investments by Financially Weak municipalities defines two subgroups. On the one hand, the general infrastructure is to be improved (see Municipal Investment Fund: Infrastructure). On the other hand, it is also about improving the school infrastructure of general education schools and vocational schools.

Thus, at the beginning of June 2015, the German Bundestag and Bundesrat passed a package of fiscal policy laws. Thirteen amendments to the Basic Law and numerous provisions in simple law the financial relations between the federal government and the states from 2020 as well as numerous federal competences. Part of the legislative amendments is the inclusion of a new Article 104c in the Basic Law, which enables the federal government to provide grants for investment in education infrastructure by their financially weak municipalities. On the basis of this new article in the Basic Law, the legislature at the same time amended the Municipal Investment a second chapter to improve the school infrastructure in financially weak municipalities and increased the Municipal Investment Promotion Fund by €3.5 billion.

We have decided to disentangle the entire program to promote investment by financially weak municipalities. The program is divided into two parts: infrastructure and schools. The former is primarily aimed at reducing regional disparities. We categorize the latter as an exogenous education investment program, given the tight earmarking of federal grants based on investments in the school sector.

Sources: Federal Ministry of Finance, Finanzbericht 2016, German Bundestag. (`https://www.bundestag.de/resource/blob/651466/d7ff7277f1c7dd1a0e3f24316454e46e/WD-8-064-19-pdf-data.pdf`, `https://dserver.bundestag.de/btd/18/046/1804653.pdf`)

3.22 University Package III ("Hochschulpakt III")

Initial Date	Duration	Series	Type	Amount (total, in €)
11th December 2014	8 years	4Q2016–4Q2023	exogenous	8.8 bn

Type of program: Education investment program

Type of investments: R&D investments and R&D grants, building & equipment GFC, education infrastructure grants for federal states and municipalities.

Short description: The federal government and the Governments of the states continue their joint efforts in the promotion of science and to strengthen research, particularly at universities, with the funding of established in the first two program phases of the Higher Education Pact since 2007 grants for funding of research projects by the German Research Foundation (DFG). The federal government provided 6.252 billion euros in the years 2016 to 2020 for the expansion of study offerings for the additional students expected according to the KMK projections of 2014. New students are expected in the third program phase (2016 to 2020), and in the years 2021 to 2023, up to 2.53 billion euros.

Since this is a continuation of the previous programs with a similar focus on R&D investment, we have applied the same evaluation standard and categorized the program as an exogenous education investment program.

Sources: Federal Ministry of Finance, Finanzbericht 2017, German Bundestag. (`https://www.gwk-bonn.de/fileadmin/Redaktion/Dokumente/Papers/BLV-HSPA-III.pdf`)

3.23 Public Transportation Investment Program ("ÖPNV Investment Programm")

Initial Date	Duration	Series	Type	Amount (total, in €)
16th June 2016	15 years	4Q2016–4Q2030	exogenous	2.5 bn

Type of program: Regional disparity

Type of investments: Infrastructure and vehicle investment.

Short description: According to the German government's Annual Economic Report 2016, a modern and efficient transportation infrastructure is one of the most important foundations for prosperity and economic growth in a modern economy. The German government is therefore continuing its policy of significantly increasing investment in transport routes.

On the basis of the Regionalization Act (RegG), the federal states receive a share of the federal tax revenue for local public transport, which is to be used in particular to finance local rail passenger transport. With the increase in these regionalization funds agreed between the federal and state governments to €8.2 billion in 2016 and the annual increase rate of 1.8% for the following years up to and including 2031, the federal government will provide a total of €15.6 billion more than previously planned up to 2031. With a total of €150 billion up to 2031, the federal government is creating a reliable financial basis and planning security for the states to organize attractive, modern local public transport.

This federal investment program is aimed at some federal states to reduce regional disparities in transportation infrastructure. For this reason, we classify it as an exogenous program to reduce regional disparities. The federal funds are disbursed in the form of grants to the beneficiary states, which can only use them for the expansion of local public transport infrastructure. This indirectly triggers public construction and equipment investments by the municipalities via the federal government.

Sources: Federal Ministry of Finance, Finanzbericht 2016, Finanzbericht 2017, German Bundestag (`file:///C:/Users/me/Downloads/20160616_top_4_bv_blf.pdf`, `https://www.bundestag.de/resource/blob/475698/990d607e188ca40a180d50b9bce6e07c/WD-5-072-16-pdf.pdf`, `https://www.bundesrat.de/SharedDocs/drucksachen/2016/0501-0600/549-16.pdf?__blob=publicationFile&v=5`)

3.24 Digitalization Program ("Digitale Infrastruktur")

Initial Date	Duration	Series	Type	Amount (total, in €)
15th March 2018	5 years	2Q2018–4Q2023	exogenous	5 bn

Type of program: Modernization program

Type of investments: Public and school infrastructure investment, digital machinery investments.

Short description: In addition to transportation infrastructure, digital infrastructure is a key strategic location factor. According to the 2016 Annual Economic Report, the German government has therefore set itself the goal of making Germany a leader in digital infrastructure.

Specifically, the federal government has drafted a law to establish the "Digital Infrastructure" special fund. In it, the federal government states its goals: *"...A secure, reliable and future-proof digital infrastructure is an essential prerequisite for economic growth. The expansion of networks is carried out by the private sector and in competition. However, there is a need for public funding, especially in rural areas where the private sector is unlikely to expand gigabit networks. As part of the priority measures, the coalition agreement provides for the establishment of a fund to promote broadband expansion and to implement the Digital Pact for Schools. The network infrastructure is to be converted to fiber-optic technology and gigabit networks are to be provided in every region. Schools in Germany will also be equipped to meet the challenges of digitalization. The goal is to create and optimize efficient, learning-friendly and resilient, technically interoperable digital and learning infrastructures for schools and school authorities in the federal states.*

This Act establishes the Digital Infrastructure Fund as a special federal fund of the federal government. The purpose of the special fund is to promote investments in the digital infrastructure and to grant financial assistance to the federal states. The funding of investments, the expansion of fiber-optic gigabit networks is supported, especially in rural regions in particular, while financial assistance will be used to support the development and improvement of the digital infrastructure for schools.

The program is focused on longer-term, structural goals. The German Council of Economic Experts concludes: *"...For the future viability of the German economy, it will also be crucial to improve the traditional and digital infrastructure by expanding public investment..."* and recommends: *"...In addition, there is considerable potential for innovation [in the German economy]. However, realizing this potential will require a high level of investment in digital infrastructure and a major effort in education to enable the current and future workforce to adapt to the demands of* *the digital workplace...*".

Since the primary objective of the program is to promote the general digital infrastructure, we believe that the investment program should be categorized primarily as an exogenous modernization program to increase potential, and only secondarily as a program for investment in education.

Sources: Federal Ministry of Finance, Finanzbericht 2019, German Bundestag, Federal Ministry of Economic Affairs, Jahreswirtschaftsbericht 2017, Council of Economic Experts, Annual Report 2017/18
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