

---

Módulo

---

**Inteligencia de negocio y visualización**

---

Nombre y apellidos      Richard Douglas Grijalba

---

Fecha entrega      02 Abril 2024

---

## Tabla de Contenido

Enunciado.....	3
<b>Primera parte : SQL Server &amp; Pentaho.....</b>	<b>4</b>
Creacion de la Base Datos Staging .....	4
Creacion de la Base warehouse.....	4
Creación de las tablas en SQL Server.....	5
Base warehouse.....	9
Creación de las tablas en SQL Server.....	10
• Tablas de base staging .....	10
• Tablas de base Data warehouse .....	10
• <b>¿Cómo se ha cargado la tabla “dim_metrica”? ¿Cuál es su origen? .....</b>	<b>12</b>
• <b>¿Qué componentes se han usado para crear la tabla de hechos? .....</b>	<b>13</b>
• <b>¿Cuántas filas se han cargado en la tabla de hechos? .....</b>	<b>13</b>
• <b>¿Por qué se han multiplicado el número de filas de la tabla de hechos? .....</b>	<b>14</b>
<b>Segunda parte : Power Bi .....</b>	<b>16</b>
<b>Paso a Paso del desarrollo del caso.....</b>	<b>20</b>
<b>SQL &amp; Pentaho.....</b>	<b>20</b>
Staging .....	22
Base warehouse.....	22
Creación de las tablas en SQL Server.....	23
Acceso a Pentaho .....	24
Crear la conexión con pentaho y SQL.....	25
Crear una entrada .....	27
Cantidad de datos cargados durante el proceso .....	31
<b>Datos cargados en la tabla SQL.....</b>	<b>32</b>
<b>Creación de tablas de metricas.....</b>	<b>36</b>
<b>Desarrollo Paso a Paso Power Bi.....</b>	<b>57</b>

# Hoja de respuestas

---

## Enunciado

Se propone un caso basado en datos del **Grupo World Bank** como en anteriores ocasiones. En este caso, se usará el conjunto de indicadores sobre la burocracia mundial.

Los indicadores de la burocracia mundial (**WWBI**) son un conjunto de datos sobre el empleo y los salarios del sector público que pueden ayudar a los investigadores y profesionales del desarrollo a obtener una mejor comprensión de las dimensiones del personal contratado por los estados, la huella del sector público en el mercado laboral general y en el fiscal las implicaciones de la factura salarial del gobierno.

El objetivo de WWBI es llenar el vacío de información sobre el personal del estado al proporcionar medidas más objetivas basadas en datos administrativos y encuestas de hogares, lo que complementará los enfoques existentes basados en la percepción de expertos.

Este conjunto de datos, como en otras ocasiones, es extraído del grupo de **datasets públicos del World bank Group**.

Responder a las cuestiones que se indican a continuación, atendiendo a los siguientes criterios:

Es fundamental acompañar las respuestas de **razonamientos y explicaciones detallados** que permitan evaluar el grado de conocimiento adquirido por el alumno a lo largo del módulo.

Asimismo, es necesario **documentar y justificar** convenientemente todos los pasos y adjuntar para ello los scripts de las consultas realizadas, capturas de pantalla, etc.

### ¿Qué datos se usarán?

Un análisis de los datos de origen en el que se detallen los campos que se encuentran en los ficheros. Se van a cargar a staging y al data mart, así como un diagrama entidad-relación del modelo.

En este punto, se tiene que realizar la **extracción de los ficheros CSV a una base de datos de staging**, usando procesos de PDI.

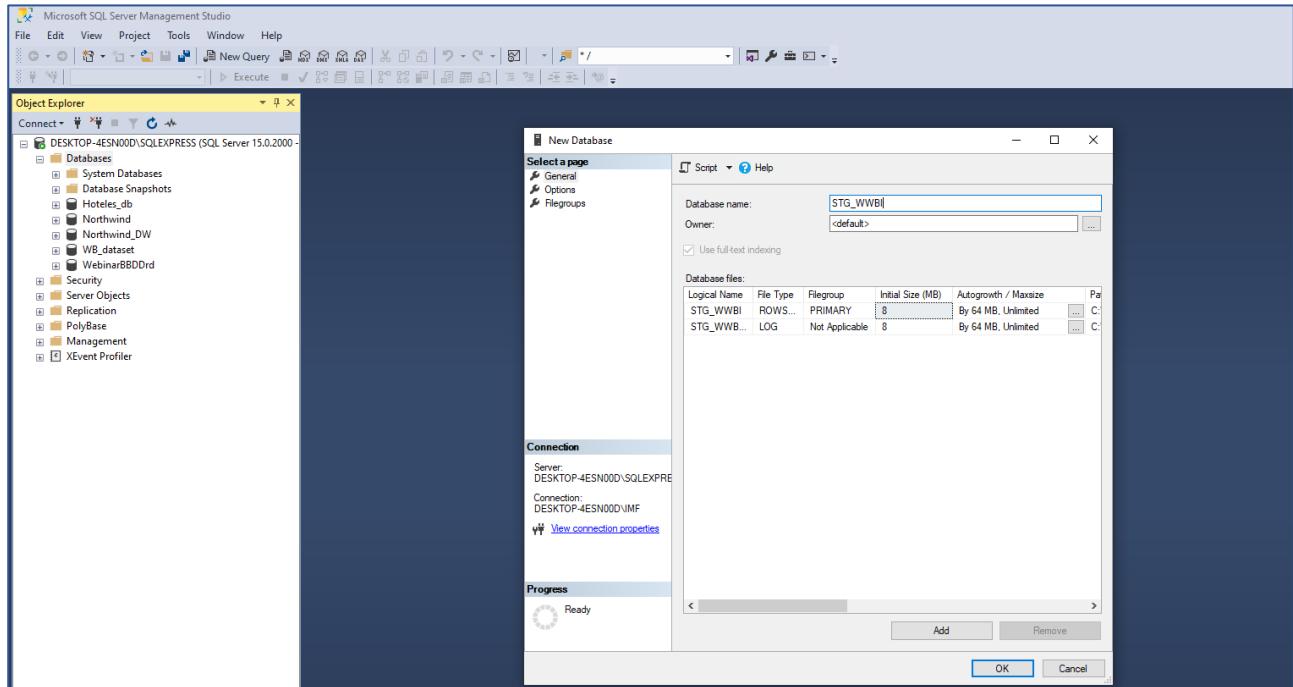
Se debe crear la base de datos de staging y sus tablas, así como los procesos de carga.

**Primer paso: crear base de datos de staging y sus tablas**, adjuntar el script de creación de las tablas.

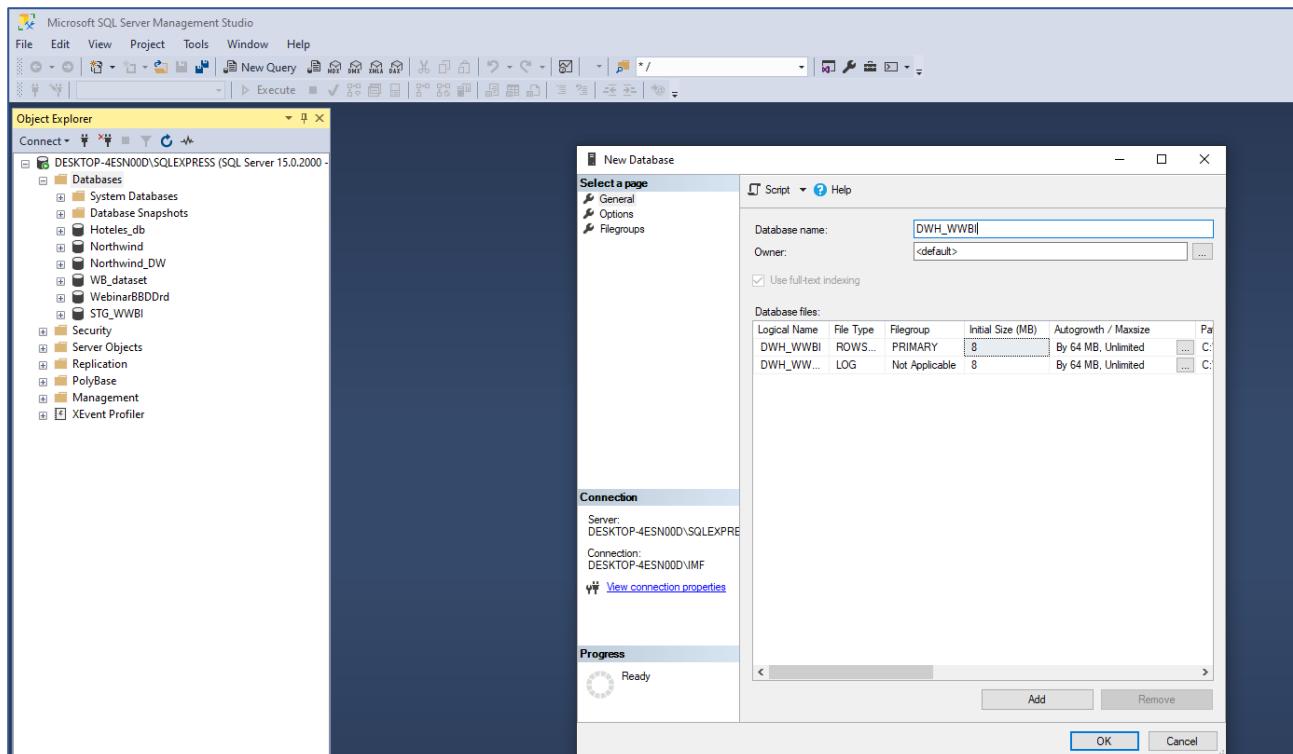
Respecto los **procesos de carga**, responder las siguientes preguntas:

## Primera parte : SQL Server & Pentaho

### Creacion de la Base Datos Staging

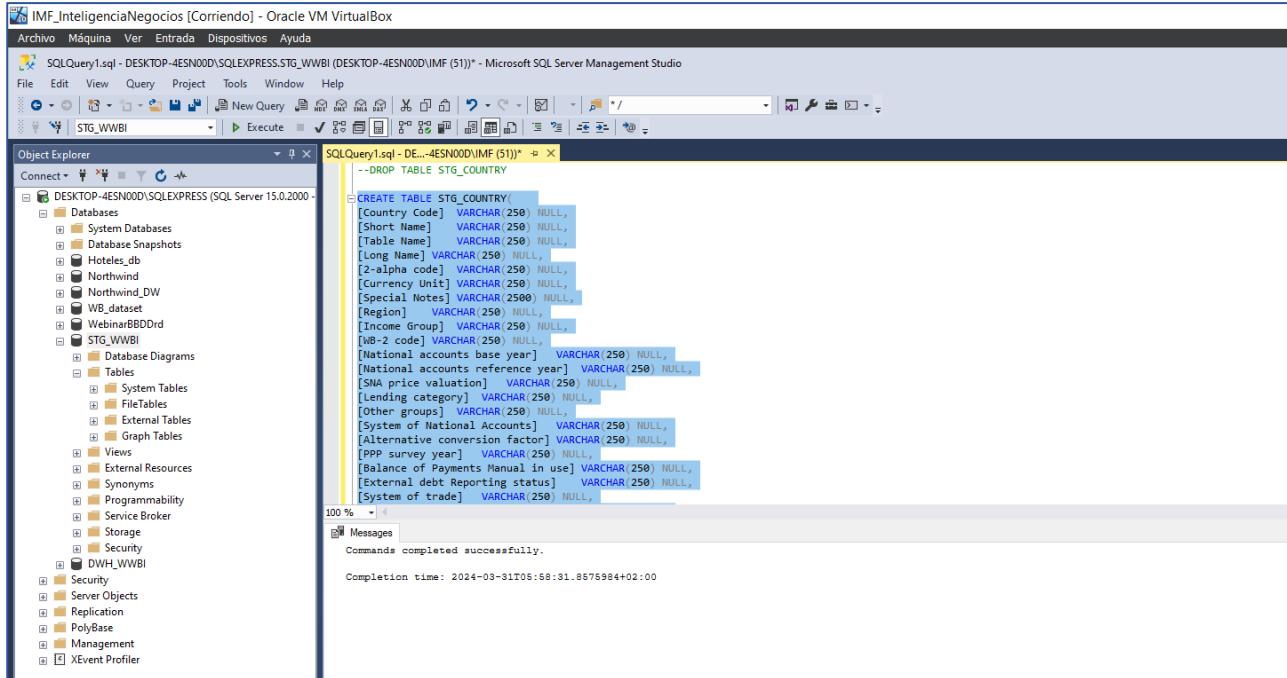


### Creacion de la Base warehouse



## Creación de las tablas en SQL Server

### • Tablas de base staging

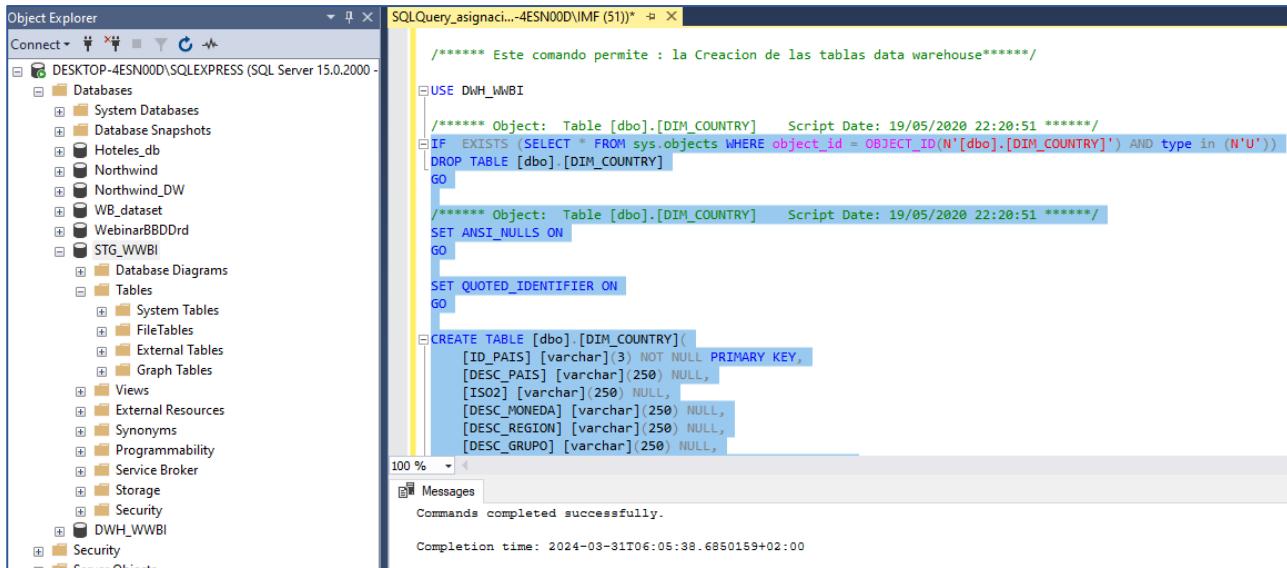


The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for the 'DESKTOP-4ESN00D\SQLEXPRESS' instance. The central pane displays a query window titled 'SQLQuery1.sql - DESKTOP-4ESN00D\SQLEXPRESS.STG\_WWBI (DESKTOP-4ESN00D\IMF (51))'. The query is:

```
--DROP TABLE STG_COUNTRY
CREATE TABLE STG_COUNTRY(
[Country Code] VARCHAR(250) NULL,
[Short Name] VARCHAR(250) NULL,
[Table Name] VARCHAR(250) NULL,
[Long Name] VARCHAR(250) NULL,
[2-alpha code] VARCHAR(250) NULL,
[Currency Unit] VARCHAR(250) NULL,
[Special Notes] VARCHAR(2500) NULL,
[Region] VARCHAR(250) NULL,
[Income Group] VARCHAR(250) NULL,
[WB-2 code] VARCHAR(250) NULL,
[National accounts base year] VARCHAR(250) NULL,
[National accounts reference year] VARCHAR(250) NULL,
[SNA price valuation] VARCHAR(250) NULL,
[Lending category] VARCHAR(250) NULL,
[Other groups] VARCHAR(250) NULL,
[System of National Accounts] VARCHAR(250) NULL,
[Alternative conversion factor] VARCHAR(250) NULL,
[PPP survey year] VARCHAR(250) NULL,
[Balance of Payments Manual in use] VARCHAR(250) NULL,
[External debt Reporting status] VARCHAR(250) NULL,
[System of trade] VARCHAR(250) NULL)
```

The 'Messages' pane at the bottom indicates 'Commands completed successfully.' and shows a completion time of '2024-03-31T05:58:31.8575984+02:00'.

### • Tablas de base Data warehouse



The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for the 'DESKTOP-4ESN00D\SQLEXPRESS' instance. The central pane displays a query window titled 'SQLQuery\_asignacion...-4ESN00D\IMF (51)'. The query is:

```
***** Este comando permite : la Creacion de las tablas data warehouse*****
USE DWH_WWBI
***** Object: Table [dbo].[DIM_COUNTRY] Script Date: 19/05/2020 22:20:51 *****
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[DIM_COUNTRY]') AND type in (N'U'))
DROP TABLE [dbo].[DIM_COUNTRY]
GO

***** Object: Table [dbo].[DIM_COUNTRY] Script Date: 19/05/2020 22:20:51 *****
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[DIM_COUNTRY](
    [ID_PAIS] [varchar](3) NOT NULL PRIMARY KEY,
    [DESC_PAIS] [varchar](250) NULL,
    [ISO2] [varchar](250) NULL,
    [DESC_MONEDA] [varchar](250) NULL,
    [DESC_REGION] [varchar](250) NULL,
    [DESC_GRUPO] [varchar](250) NULL,
```

The 'Messages' pane at the bottom indicates 'Commands completed successfully.' and shows a completion time of '2024-03-31T06:05:38.6850159+02:00'.

- ¿Cuántas filas se han cargado en la tabla de staging País?

Vista desde la consulta realizada en SQL Server. 115 filas

```
***** Este comando permite : conocer el total de filas de la tabla country *****/
SELECT COUNT(*) AS TotalFilas
FROM STG_COUNTRY;
```

The screenshot shows a SQL query in the 'Results' tab of SSMS. The query counts all rows in the 'STG\_COUNTRY' table. The results table has one row with the value '115'.

TotalFilas
115

Vista desde Pentaho - Spoon

Execution Results													
	Nombre paso	Numero Copia	Leído	Escrito	Entrada	Salida	Actualizado	Rejected	Errores	Activo	Tiempo	Velocidad (r/s)	Pri/E/S
1	CSV_Country	0	0	115	116	0	0	0	0	Finalizado	0.1s	1.184	-
2	CSV_Data	0	0	10005	10006	0	0	0	0	Finalizado	0.3s	35.357	-
3	STG_Data Mapping	0	10005	10005	0	0	0	0	0	Finalizado	0.6s	16.675	-
4	STG_country Mapping	0	115	115	0	0	0	0	0	Finalizado	0.3s	340	-
5	STG_country	0	115	115	0	115	0	0	0	Finalizado	1.0s	113	-
6	STG_Data	0	10005	10005	0	10005	0	0	0	Finalizado	2.2s	4.552	-

- ¿Cuántas filas se han cargado en la tabla de staging de datos?

Vista desde SQL Server un total de 10 005 filas.

```
***** Este comando permite : conocer el total de filas de la tabla data *****/
SELECT COUNT(*) AS TotalFilas
FROM STG_DATA;
```

The screenshot shows a SQL query in the 'Results' tab of SSMS. The query counts all rows in the 'STG\_DATA' table. The results table has one row with the value '10005'.

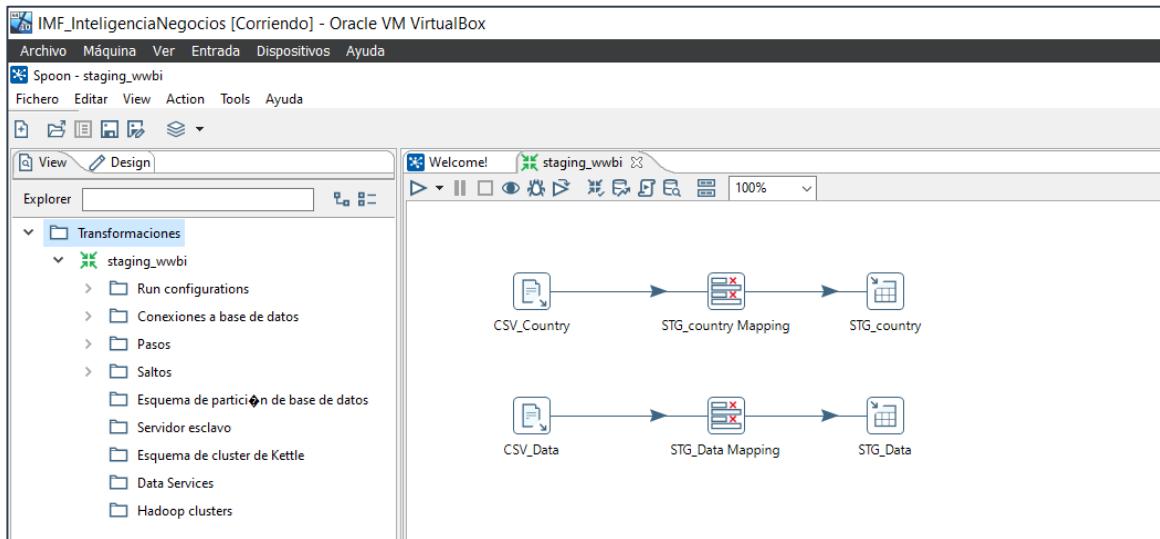
TotalFilas
10005

Vista desde Pentaho - Spoon

Execution Results													
	Nombre paso	Numero Copia	Leído	Escrito	Entrada	Salida	Actualizado	Rejected	Errores	Activo	Tiempo	Velocidad (r/s)	Pri/E/S
1	CSV_Country	0	0	115	116	0	0	0	0	Finalizado	0.1s	1.184	-
2	CSV_Data	0	0	10005	10006	0	0	0	0	Finalizado	0.3s	35.357	-
3	STG_Data Mapping	0	10005	10005	0	0	0	0	0	Finalizado	0.6s	16.675	-
4	STG_country Mapping	0	115	115	0	0	0	0	0	Finalizado	0.3s	340	-
5	STG_country	0	115	115	0	115	0	0	0	Finalizado	1.0s	113	-
6	STG_Data	0	10005	10005	0	10005	0	0	0	Finalizado	2.2s	4.552	-

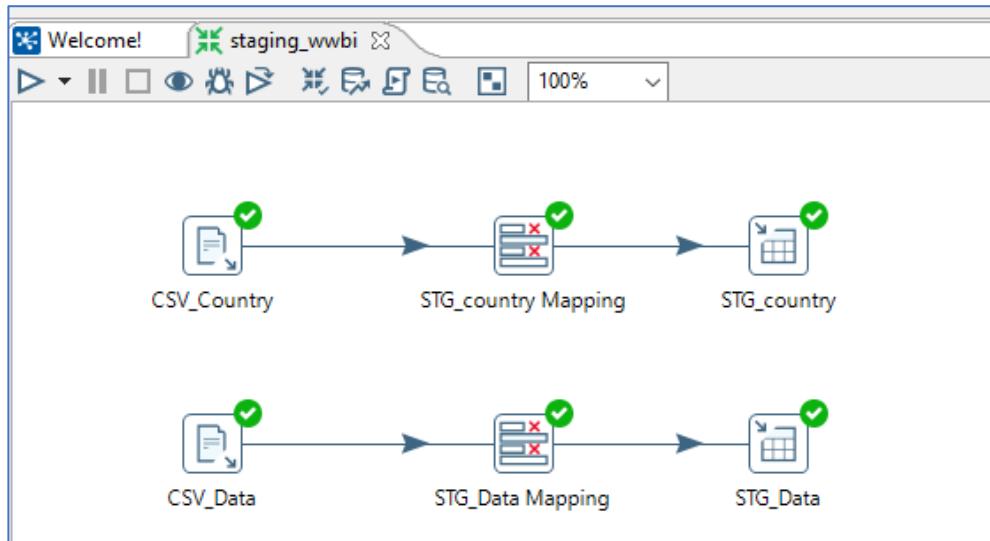
- ¿Cuántas transformaciones has usado para realizar la carga?

En el proceso de transformaciones utilizando Pentaho para la carga del Staging para country y Data, un total de una transformación, en la que se incluyen dos procesos los cuales se aprecian en la siguiente imagen.



- **¿Qué objetos has usado en estas transformaciones?**

1. Se agregaron objetos de carga de un archivo CSV, posteriormente se crea un objeto de salida tipo TABLA SQL, y se crea un objeto tipo MAPEO el cual se coloca en medio de los objetos previamente mencionados, esto para ambas tablas STAGING Country y Data.



## Execution Results

Execution History Logging Step Metrics Performance Graph Metrics Preview data



```
2024/04/01 04:14:04 - Carte - Installing timer to purge stale objects after 1440 minutes.
2024/04/01 04:15:59 - Spoon - Using legacy execution engine
2024/04/01 04:15:59 - Spoon - Transformación abierta.
2024/04/01 04:15:59 - Spoon - Ejecutando transformación [staging_wwbi]...
2024/04/01 04:15:59 - Spoon - Se ha iniciado la ejecución de la transformación.
2024/04/01 04:16:00 - staging_wwbi - Iniciado despacho de la transformación [staging_wwbi]
2024/04/01 04:16:01 - STG_Data.0 - Connected to database [STG_WWBI] (commit=1000)
2024/04/01 04:16:01 - STG_country.0 - Connected to database [STG_WWBI] (commit=1000)
2024/04/01 04:16:01 - CSV_Data.0 - Header row skipped in file 'C:\Users\IMF\Desktop\Recursos\ENTREGA FINAL\CP_FINAL\WWBI_csv\WWBIData.csv'
2024/04/01 04:16:01 - CSV_Country.0 - Header row skipped in file 'C:\Users\IMF\Desktop\Recursos\ENTREGA FINAL\CP_FINAL\WWBI_csv\WWBICountry.csv'
2024/04/01 04:16:01 - CSV_Country.0 - Procesamiento finalizado (I=116, O=0, R=0, W=115, U=0, E=0)
2024/04/01 04:16:01 - CSV_Data.0 - Procesamiento finalizado (I=10006, O=0, R=0, W=10005, U=0, E=0)
2024/04/01 04:16:01 - STG_country Mapping.0 - Procesamiento finalizado (I=0, O=0, R=115, W=115, U=0, E=0)
2024/04/01 04:16:01 - STG_Data Mapping.0 - Procesamiento finalizado (I=0, O=0, R=10005, W=10005, U=0, E=0)
2024/04/01 04:16:02 - STG_country.0 - Procesamiento finalizado (I=0, O=115, R=115, W=115, U=0, E=0)
2024/04/01 04:16:03 - STG_Data.0 - Procesamiento finalizado (I=0, O=10005, R=10005, W=10005, U=0, E=0)
2024/04/01 04:16:03 - Spoon - La transformación ha finalizado!!
```

- **¿Has usado el componente Start?**

En el inicio de crear las relaciones a bases de datos y creación de los objetos de transformación no fue necesario crear o utilizar el botón de Start.

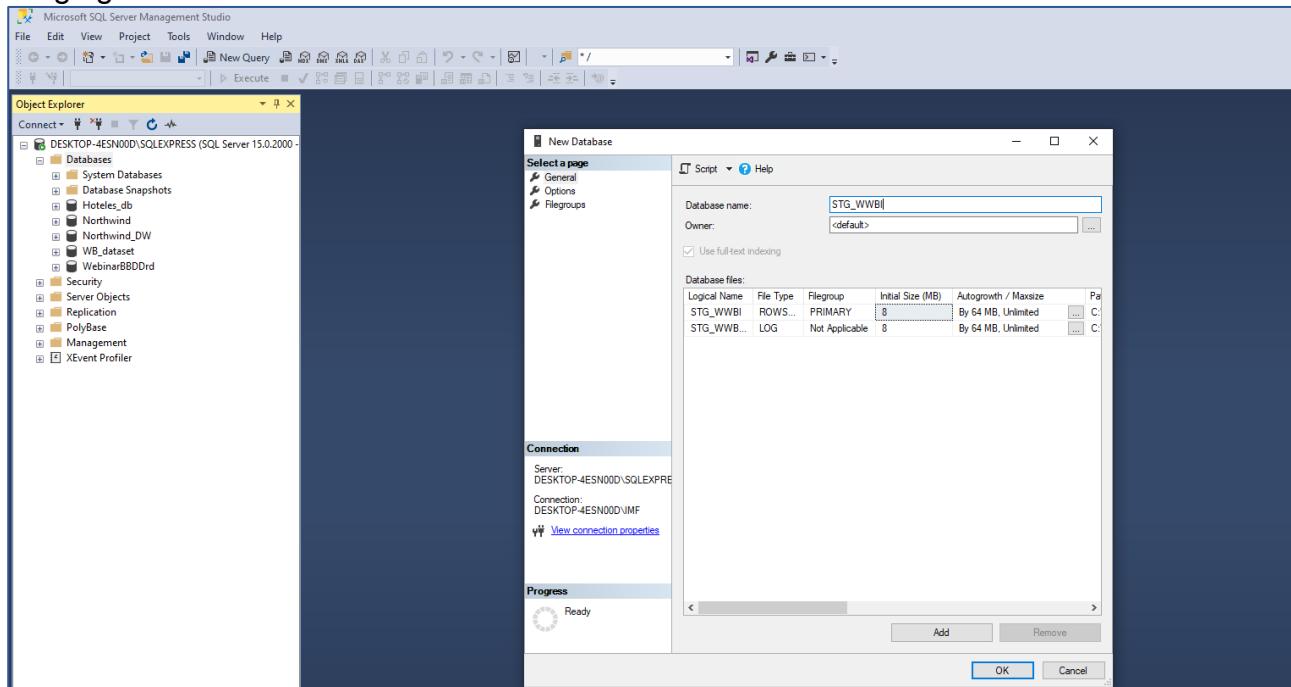
La opción de Start se utilizó en el proceso de crear el Job de flujo del proceso, el mismo se evidencia más adelante.

- **En este punto se tiene que realizar las transformaciones y carga de los datos desde la base de datos de staging al data warehouse .**

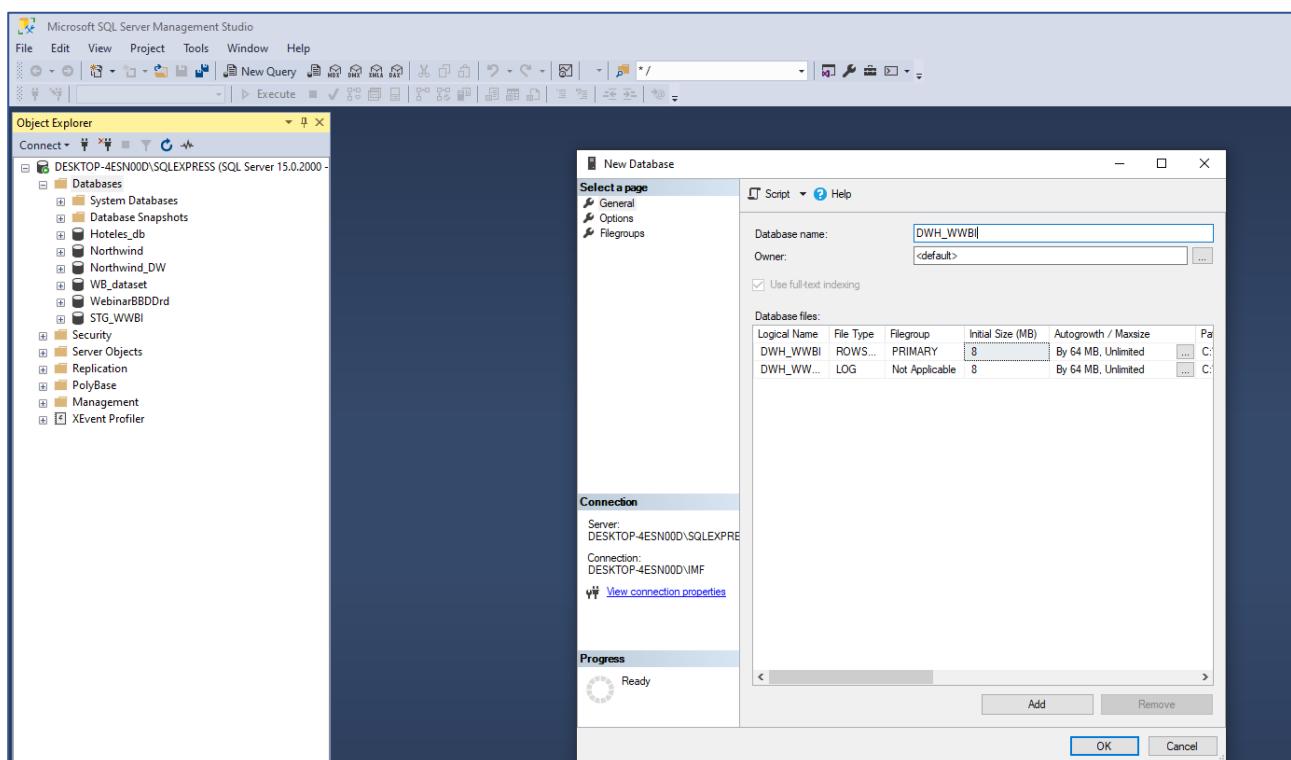
Para ello, se debe crear una base de datos data warehouse y sus tablas. Estas se cargarán usando PDI.

- **Crear el datamart WWBI y las tablas.** Adjuntar scripts de creación de tablas.
- Realizar las transformaciones necesarias para **cargar el datamart usando PDI**.
- Responder las siguientes preguntas:

## Creacion de las bases de datos Staging



## Base warehouse



## Creación de las tablas en SQL Server

- Tablas de base staging

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows a connection to DESKTOP-4ESN00D\SQLEXPRESS (SQL Server 15.0.2000). The current database is STG\_WWBI. The right pane displays a query window titled 'SQLQuery1.sql - DE...-4ESN00D\IMF (51)\*'. The query is:

```
--DROP TABLE STG_COUNTRY
CREATE TABLE STG_COUNTRY(
[Country Code] VARCHAR(250) NULL,
[Short Name] VARCHAR(250) NULL,
[Table Name] VARCHAR(250) NULL,
[Long Name] VARCHAR(250) NULL,
[2-alpha code] VARCHAR(250) NULL,
[Currency Unit] VARCHAR(250) NULL,
[Special Notes] VARCHAR(2500) NULL,
[Region] VARCHAR(250) NULL,
[Income Group] VARCHAR(250) NULL,
[WB-2 code] VARCHAR(250) NULL,
[National accounts base year] VARCHAR(250) NULL,
[National accounts reference year] VARCHAR(250) NULL,
[SNA price valuation] VARCHAR(250) NULL,
[Lending category] VARCHAR(250) NULL,
[Other groups] VARCHAR(250) NULL,
[System of National Accounts] VARCHAR(250) NULL,
[Alternative conversion factor] VARCHAR(250) NULL,
[PPP survey year] VARCHAR(250) NULL,
[Balance of Payments Manual in use] VARCHAR(250) NULL,
[External debt Reporting status] VARCHAR(250) NULL,
[System of trade] VARCHAR(250) NULL)
```

The 'Messages' pane at the bottom indicates 'Commands completed successfully.' and 'Completion time: 2024-03-31T05:58:31.8575984+02:00'.

- Tablas de base Data warehouse

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows a connection to DESKTOP-4ESN00D\SQLEXPRESS (SQL Server 15.0.2000). The current database is DWH\_WMBI. The right pane displays a query window titled 'SQLQuery\_asignaci...-4ESN00D\IMF (51)\*'. The query is:

```
/*
Este comando permite : la Creacion de las tablas data warehouse*****
*/
USE DWH_WMBI
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[DIM_COUNTRY]') AND type in (N'U'))
DROP TABLE [dbo].[DIM_COUNTRY]
GO

SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[DIM_COUNTRY](
    [ID_PAIS] [varchar](3) NOT NULL PRIMARY KEY,
    [DESC_PAIS] [varchar](250) NULL,
    [ISO2] [varchar](250) NULL,
    [DESC_MONEDA] [varchar](250) NULL,
    [DESC_REGION] [varchar](250) NULL,
    [DESC_GRUPO] [varchar](250) NULL,
```

The 'Messages' pane at the bottom indicates 'Commands completed successfully.' and 'Completion time: 2024-03-31T06:05:38.6850159+02:00'.

## Revision de los datos cargados en SQL Server en las tablas Staging

### Tabla Staging Data

SQLQuery2.sql - DE...-4ESN00D\IMF (57) - Microsoft SQL Server Management Studio

```
SELECT TOP (1000) [Country Name]
      ,[Indicator Name]
      ,[Indicator Code]
      ,[a2000]
      ,[a2001]
      ,[a2002]
      ,[a2003]
      ,[a2004]
      ,[a2005]
      ,[a2006]
      ,[a2007]
      ,[a2008]
      ,[a2009]
      ,[a2010]
      ,[a2011]
      ,[a2012]
      ,[a2013]
      ,[a2014]
      ,[a2015]
      ,[a2016]
   FROM [STG_WWB1].[dbo].[STG_DATA]
```

Country Name	Indicator Name	Indicator Code	a2000	a2001	a2002	a2003	a2004	a2005	a2006	a2007	a2008	a2009	a2010	a2011	a2012	a2013	a2014	a2015	a2016
298 Argentina	Median age of private paid employees	BI.PWK.AGES.PV.MD	33	34	33	35	34	34	34	34	35	35	35	35	35	36	NULL	NULL	
299 Argentina	Median age of public paid employees	BI.PWK.AGES.PB.MD	41	41	41	40	41	41	41	42	42	42	42	42	40	41	41	NULL	
300 Argentina	Number of employed individuals	BI.EMP.TOTL.NO	28368	27533	25686	27199	28355	37467	40169	24793	38723	37121	36934	36711	35315	35535	38369	NULL	
301 Argentina	Number of paid employees	BI.PWK.TOTL.NO	20607	19910	18925	20014	21109	27999	30502	19024	29665	28346	28634	28072	27067	27251	29276	NULL	
302 Argentina	Number of public paid employees	BI.PWK.PUBS.NO	6464	6500	7499	6549	6291	8016	8925	5435	8526	8343	8229	8020	7859	8022	8590	NULL	
303 Argentina	Pay compression ratio in private sector	BI.WAG.CPRS.PV.ZS	6.66...	8.30...	8.33...	9.92...	8.09...	8.33...	9.15...	8.33...	8.26...	8.19...	7.03...	7.64...	8.25...	7.03...	6.76...	NULL	
304 Argentina	Pay compression ratio in public sector	BI.WAG.CPRS.PB.ZS	6.49...	6.88...	7.31...	5.83...	4.94...	4.5...	4.40...	5...	4.37...	4.20...	4.39...	4.65...	4.39...	4.00...	4.70...	NULL	
305 Argentina	Proportion of total employees with tertiary education	BI.EMP.TOTL.PB.TT.ZS	0.28...	0.29...	0.28...	0.27...	0.28...	0.28...	0.27...	0.27...	0.27...	0.27...	0.26...	0.28...	0.30...	0.30...	0.30...	NULL	
306 Argentina	Public sector employment as a share of formal employees	BI.EMP.FRM1.PB.ZS	0.32...	0.34...	0.36...	0.36...	0.34...	0.32...	0.32...	0.32...	0.32...	0.30...	0.30...	0.28...	0.29...	0.32...	0.32...	0.31...	
307 Argentina	Public sector employment as a share of paid employees	BI.EMP.PWPK.PB.ZS	0.23...	0.24...	0.31...	0.28...	0.25...	0.23...	0.22...	0.22...	0.21...	0.21...	0.21...	0.23...	0.23...	0.23...	0.23...	NULL	
308 Argentina	Public sector employment as a share of paid employees	BI.EMP.PWPK.PB.FF.ZS	0.28...	0.30...	0.39...	0.34...	0.31...	0.29...	0.28...	0.26...	0.25...	0.25...	0.25...	0.26...	0.28...	0.27...	0.28...	NULL	

### Tabla Staging Country

SQLQuery2.sql - DE...-4ESN00D\IMF (57) - Microsoft SQL Server Management Studio

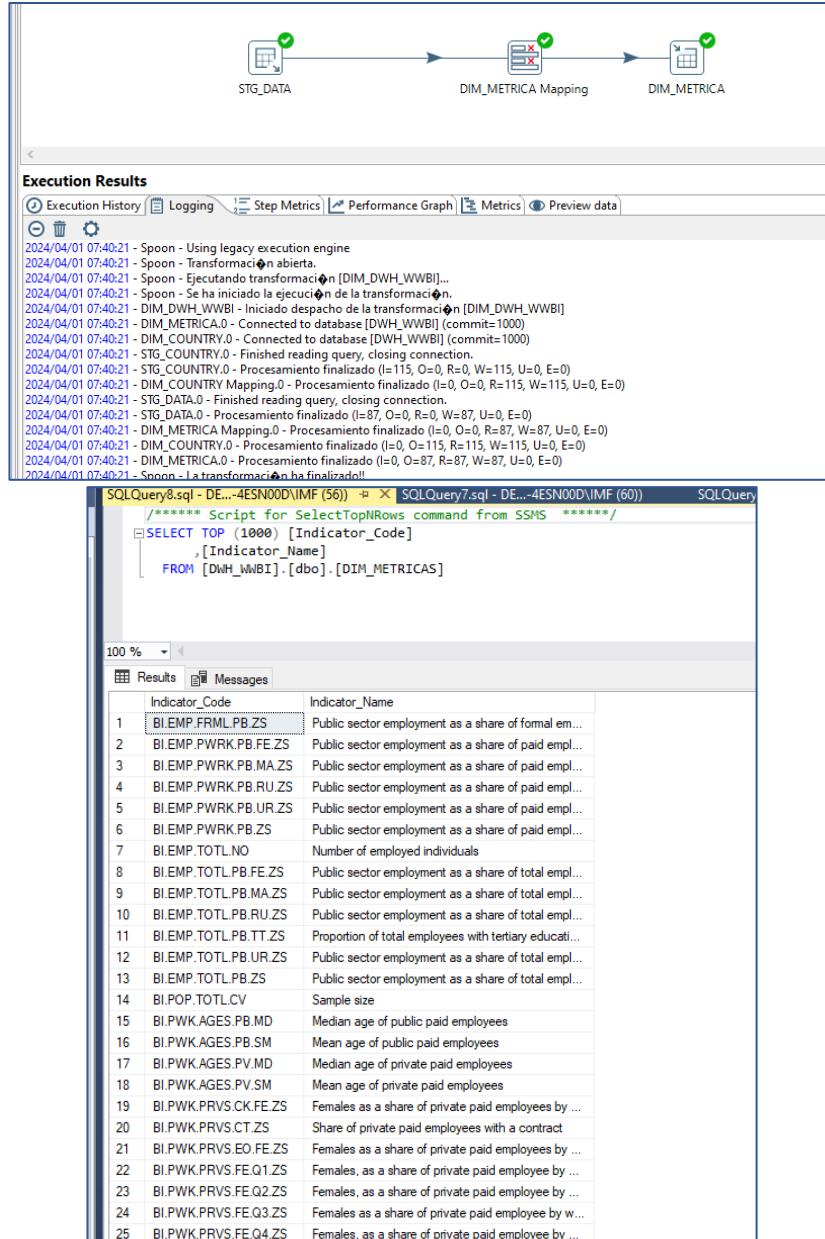
```
SELECT TOP (1000) [Country Code]
      ,[Short Name]
      ,[Table Name]
      ,[Long Name]
      ,[2-alpha code]
      ,[Currency Unit]
      ,[Special Notes]
      ,[Region]
      ,[Income Group]
      ,[WB-2 code]
      ,[National accounts base year]
      ,[National accounts reference year]
      ,[SMA price valuation]
      ,[Lending category]
      ,[Other groups]
      ,[System of National Accounts]
      ,[Alternative conversion factor]
      ,[PPG survey year]
      ,[Basic Payments Manual in use]
      ,[External debt Reporting status]
      ,[System of trade]
      ,[Government Accounting concept]
      ,[IMF data dissemination standard]
      ,[Latest population census]
      ,[Latest household survey]
      ,[Source of most recent Income and expenditure data]
      ,[Initial contribution completed]
```

Country Code	Short Name	Table Name	Long Name	2-alpha code	Currency Unit	Special Notes	Region	Income Group	WB-2 code	National accounts bi...
1 AFG	Afghanistan	Islamic State of Afghanistan	AF	Afghan afghani	Fiscal year end: March 20; reporting period for nat...	South Asia	Low income	AF	2002/03	
2 AGO	Angola	People's Republic of Angola	AO	Angolan kwanza	NULL	Sub-Saharan Africa	Lower middle income	AO	2002	
3 ALB	Albania	Republic of Albania	AL	Albanian lek	NULL	Europe & Central Asia	Upper middle income	AL	Original chained cor...	
4 ARG	Argentina	Argentina	AR	Argentine peso	National Institute of Statistics and Census revised ...	Latin America & Caribbean	High income	AR	2004	
5 BEN	Benin	Republic of Benin	BJ	West African CFA franc	NULL	Sub-Saharan Africa	Low income	BJ	2007	
6 BFA	Burkina Faso	Burkina Faso	BF	West African CFA franc	NULL	Sub-Saharan Africa	Low income	BF	1999	
7 BGD	Bangladesh	People's Republic of Bangladesh	BD	Bangladeshi taka	Fiscal year end: June 30; reporting period for nat...	South Asia	Lower middle income	BD	2005/06	
8 BGR	Bulgaria	Republic of Bulgaria	BG	Bulgarian lev	NULL	Europe & Central Asia	Upper middle income	BG	Original chained cor...	
9 BIH	Bosnia and Herzegovina	Bosnia and Herzegovina	BA	Bosnia and Herzegovina convertible mark	NULL	Europe & Central Asia	Upper middle income	BA	Original chained cor...	
10 BOL	Bolivia	Plurinational State of Bolivia	BO	Bolivian Boliviano	NULL	Latin America & Caribbean	Lower middle income	BO	1999	
11 BRA	Brazil	Federative Republic of Brazil	BR	Brazilian real	NULL	Latin America & Caribbean	Upper middle income	BR	Original chained cor...	
12 PRI	Puerto Rico	Puerto Rico	PR	U.S. dollar	Fiscal year end: June 30; reporting period for nat...	Latin America & Caribbean	High income	PR	1954	

- ¿Cómo se ha cargado la tabla “dim\_metrica”? ¿Cuál es su origen?

En lo que respecta a la tabla de Metricas, no existe un archivo u origen llamado “Series” o similar, sin embargo en el archivo origen de Data, se observa que se pueden seleccionar datos de esta para crear o alimentar la tabla “Metricas”.

Por lo que se procedió a alimentar la tabla “dim\_metrica” por medio de la tabla de Stagin Data.



- ¿Qué componentes se han usado para crear la tabla de hechos?

La tabla de hechos denominada Fact contiene las siguientes columnas:

- ID\_PAIS
- ID\_METRICA
- ID\_AÑO
- IN\_VALUE

```

/*
***** Script for SelectTopNRows command from SSMS *****/
SELECT TOP (1000) [ID_PAIS]
      ,[ID_METRICA]
      ,[ID_AÑO]
      ,[IN_VALUE]
  FROM [DWH_WMBI].[dbo].[FACT_WDI]
  
```

	ID_PAIS	ID_METRICA	ID_AÑO	IN_VALUE
136	ARG	BI.WAG.PRVS.F...	2016	NULL
137	ARG	BI.WAG.PUBS.F...	2000	0.78911...
138	ARG	BI.WAG.PUBS.F...	2001	0.77094...
139	ARG	BI.WAG.PUBS.F...	2002	0.73551...
140	ARG	BI.WAG.PUBS.F...	2003	0.85177...
141	ARG	BI.WAG.PUBS.F...	2004	0.83988...
142	ARG	BI.WAG.PUBS.F...	2005	0.84242...
143	ARG	BI.WAG.PUBS.F...	2006	0.85488...
144	ARG	BI.WAG.PUBS.F...	2007	0.81185...
145	ARG	BI.WAG.PUBS.F...	2008	0.84009...
146	ARG	BI.WAG.PUBS.F...	2009	0.85086...

- ¿Cuántas filas se han cargado en la tabla de hechos?

El total de filas que se observan en la carga de la tabla de hechos es de 16 813

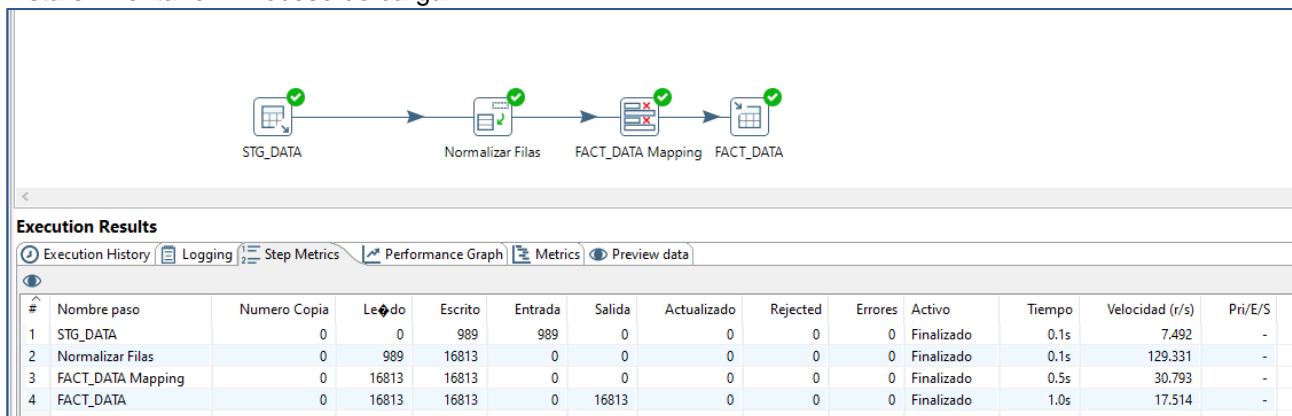
```

/*
***** Este comando permite : Contar la cantidad de filas de la tabla de hechos*****
*/

SELECT COUNT(*) AS TotalFilas
FROM FACT_WDI;
  
```

TotalFilas
16813

Vista en Pentaho – Proceso de carga



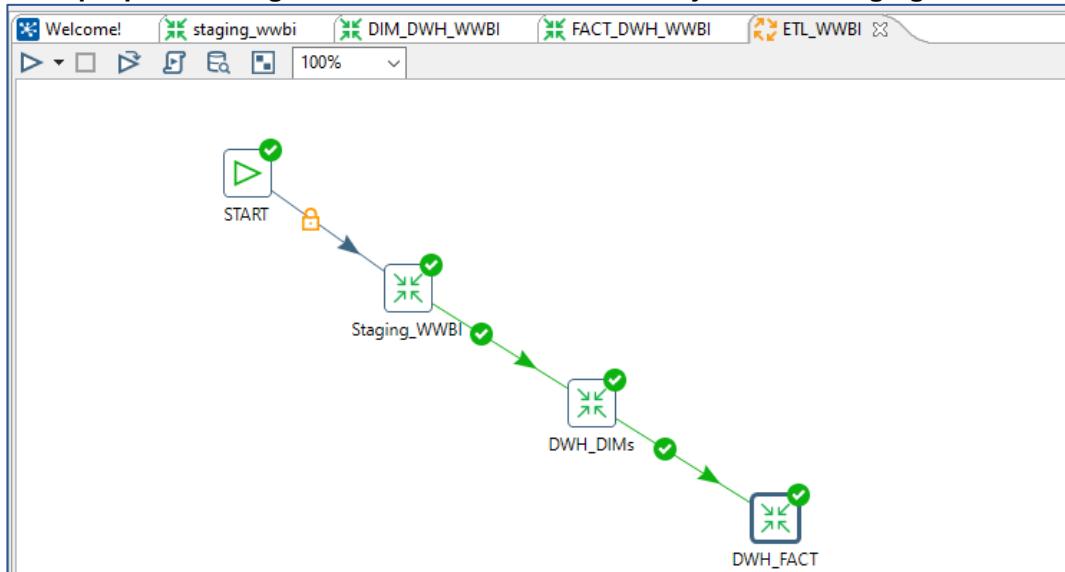
- ¿Por qué se han multiplicado el número de filas de la tabla de hechos?

El aumento de la cantidad de las filas en la tabla de hechos tiene que ver con el proceso realizado denominado **Normalización**, en el que se le realizó un pivoteo a la información por los años, al asignar los datos según los años de la forma correcta genera un incremento en la cantidad de las líneas.

Se produce una reducción de la cantidad de las columnas, pero se aumenta la cantidad de las filas.

#	Country Name	Country Code	Indicator Name	Indicator Code	ID_AÑO	IN_VALUE
1	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2000	23278
2	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2001	<null>
3	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2002	<null>
4	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2003	<null>
5	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2004	<null>
6	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2005	<null>
7	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2006	<null>
8	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2007	<null>
9	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2008	17361
10	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2009	<null>
11	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2010	<null>
12	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2011	<null>
13	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2012	<null>
14	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2013	<null>
15	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2014	509107
16	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2015	<null>
17	Angola	AGO	Number of employed individuals	BLEMP.TOTL.NO	2016	<null>
18	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2000	6846
19	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2001	<null>
20	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2002	<null>
21	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2003	<null>
22	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2004	<null>
23	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2005	<null>
24	Angola	AGO	Number of paid employees	BLPVK.TOTL.NO	2006	<null>

Crear la tarea que permita cargar todo el datamart desde los 14 ejecución > staging > datamart.



- ¿Se ha usado una transformación o una tarea?

Por medio de la creación de un JOB se debe agregar un Start, transformación.

- ¿Por qué?

Se requiere en una hoja (pestaña) aparte crear un nuevo “Trabajo” y por medio de esto se crea el proceso de flujo de trabajo.

- ¿Qué tipo de objetos se han usado?

Para este proceso se crea un objeto de Start, y tres Transformaciones

- Responder las siguientes preguntas realizando consultas SQL:

- ¿Cuántos países pertenecen a cada grupo de ingresos (income group)?

```
***** Este comando permite : Cuantos paises pertenecen a Income Group*****
SELECT DESC_GRUPO, COUNT(*) AS cantidad_paises
FROM DIM_COUNTRY
GROUP BY DESC_GRUPO;
```

DESC_GRUPO	cantidad_paises
1 High income	21
2 Low income	27
3 Lower middle income	37
4 Upper middle income	30

- ¿Cuántas métricas existen? ¿Y que tengan valor no nulo en el año 2000?

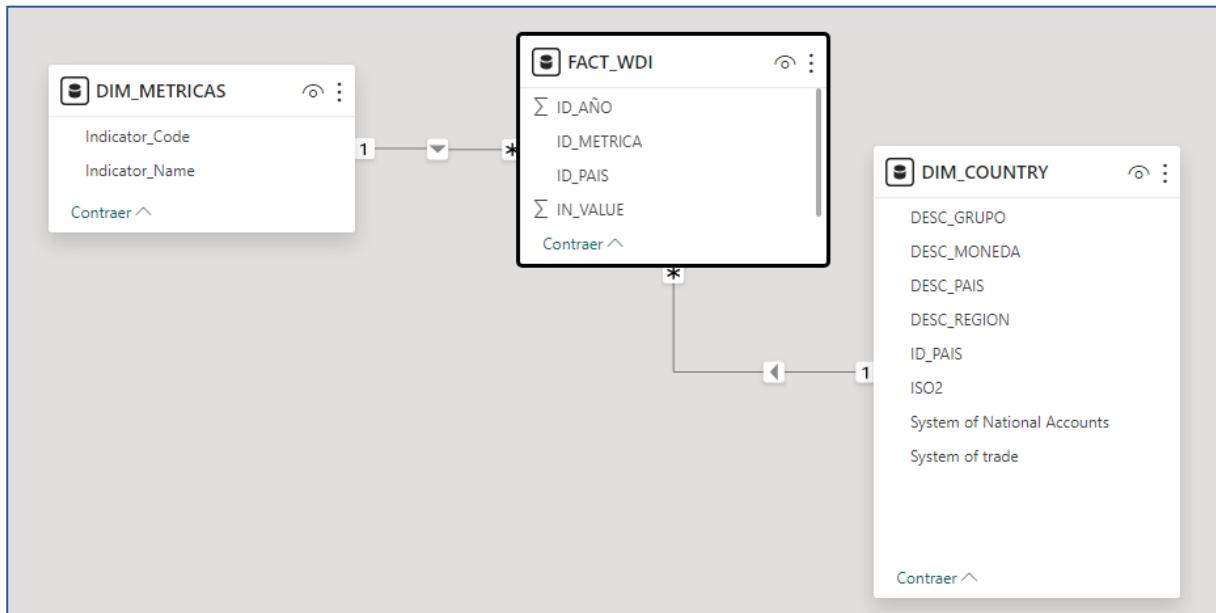
```
***** Este comando permite : Cuantos paises pertenecen a Income Group*****
SELECT COUNT(ID_METRICA) AS Metricas_sin_Nulos
FROM FACT_WDI
WHERE ID_AÑO = 2000 AND IN_VALUE IS NOT NULL;
```

Metricas_sin_Nulos
1 989

## Segunda parte : Power Bi

Crear un **informe** en Power Bi accediendo a la información del datamart recién cargado.

1. Indicar la **estructura del modelo de datos**. Definir las tablas, sus relaciones y cardinalidades.



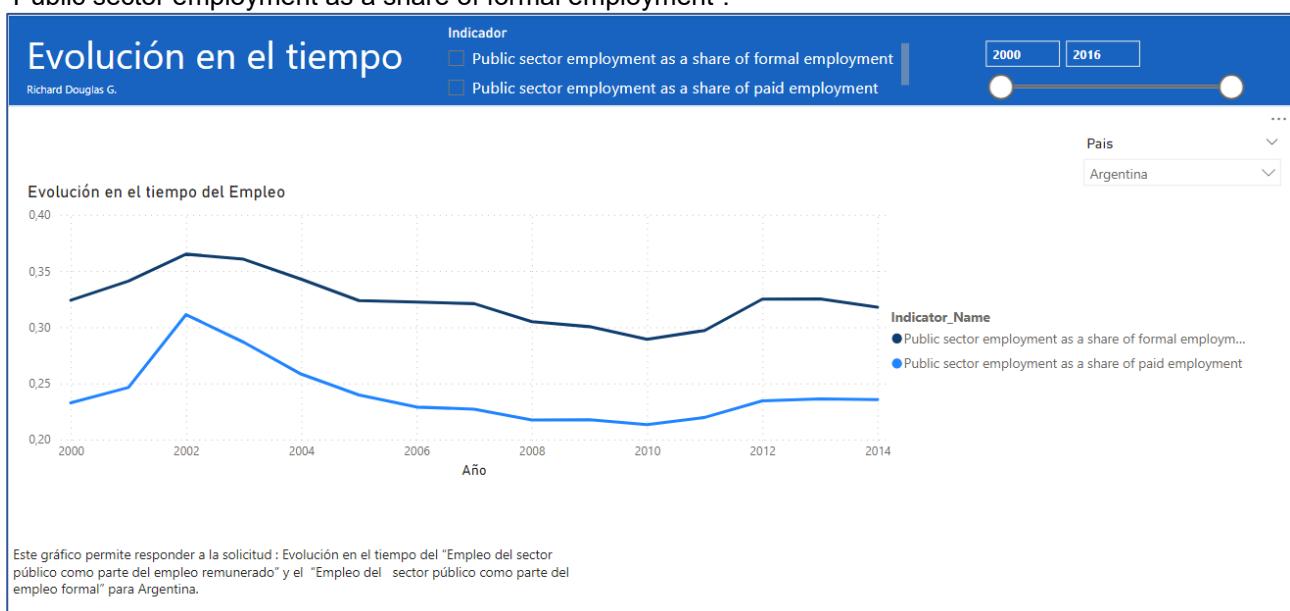
Crear las siguientes **visualizaciones**, adjuntar comentarios de por qué se eligió cada tipo de visualización, así como capturas de pantalla con los gráficos.

**Evolución en el tiempo del “Empleo del sector público como parte del empleo remunerado” y el “Empleo del sector público como parte del empleo formal” para Argentina.**

Las métricas que se han de usar son las siguientes:

“Public sector employment as a share of paid employment”.

“Public sector employment as a share of formal employment”.



## 1. ¿Qué tipo de gráfico se ha usado y por qué?

Se utilizó un gráfico de líneas el cual permite un seguimiento o visualización del comportamiento de una serie a través del tiempo.

## 2. ¿Qué campo se ha usado para filtrar los datos?

Se procede a utilizar para el filtro de los campos, el que corresponde a la tabla de DIM Metricas el campo del indicador el cual cumple con lo solicitado “Public sector employment as a share of paid employment”, “Public sector employment as a share of formal employment”, además de utilizar el campo Country o País para filtrarlo por el Argentina.

## 3. ¿Qué campo se ha usado para el eje de la gráfica?

En este caso se utilizó el campo de año

## 4. ¿Y en la leyenda?

La Leyenda corresponde a indicador Name que contiene los campos a mostrar, “Public sector employment as a share of paid employment”, “Public sector employment as a share of formal employment”.

## 5. ¿Qué campo se usó para mostrar como valores?

Para la gráfica se utilizó el campo In Value que se encuentra en la tabla Fact

### Evaluar la edad media de los empleados del sector privado y público por región.

Las métricas que se han de utilizar son las siguientes:

“Mean age of private paid employees”.

“Mean age of public paid employees”.



## 1. ¿Qué tipo de gráfico se ha usado y por qué?

Se ha utilizado un gráfico de columnas agrupadas, esto permite comparar varias series o campos distintos según su comportamiento.

## 2. ¿Qué campo se ha usado para filtrar los datos?

Los campos se encuentran filtrados por el campo de Indicador Name, el cual contiene la información de “Mean age of private paid employees”. “Mean age of public paid employees”.

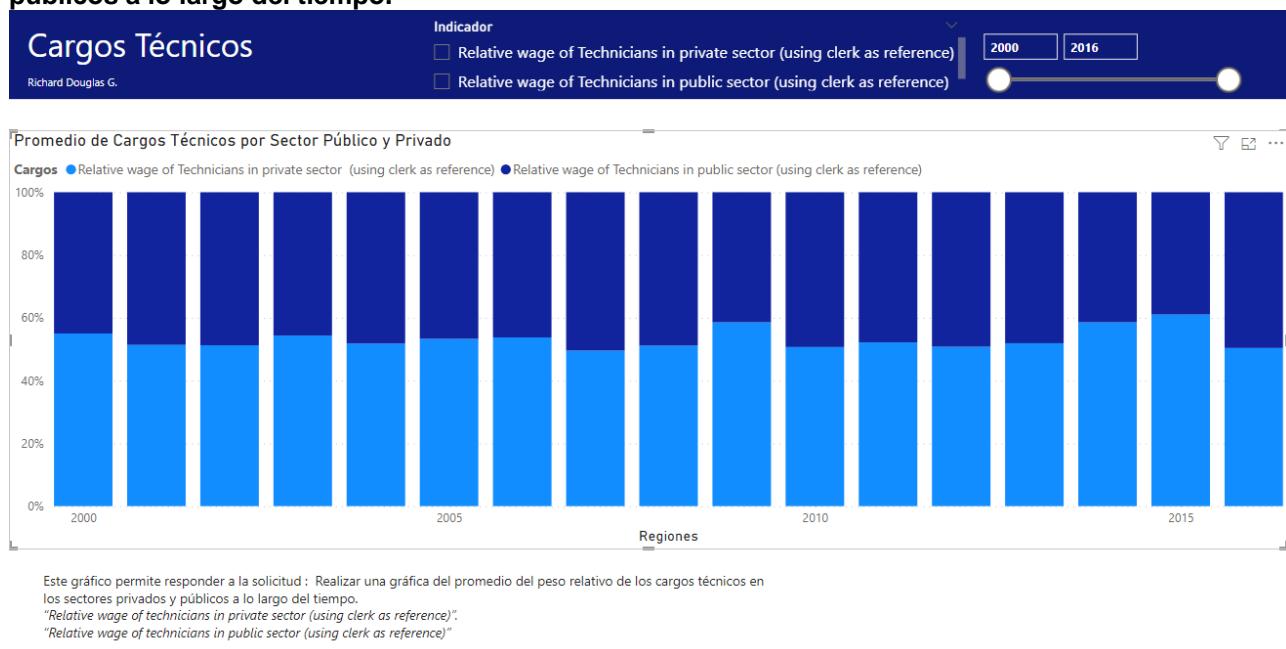
## 3. ¿Qué campo se ha usado para el eje de la gráfica?

En el eje X se encuentra la descripción de la región

## 4. ¿Y en la leyenda?

En la leyenda se encuentra el campo el campo de Indicador Name.

**Realizar una gráfica del promedio del peso relativo de los cargos técnicos en los sectores privados y públicos a lo largo del tiempo.**



La gráfica debe permitir ver el total volumen de cada métrica y el total de ambas. Las métricas que se han de usar son las siguientes:

“Relative wage of technicians in private sector (using clerk as reference)”.

“Relative wage of technicians in public sector (using clerk as reference)”

## 1. ¿Qué tipo de gráfico se ha usado y por qué?

En este caso se utiliza un gráfico de barras 100%, esto para ver el peso de las dos características.

## 2. ¿Qué campo se ha usado para filtrar los datos?

El campo que se utiliza para filtrar los datos corresponde a campo de Indicador Name

## 3. ¿Qué campo se ha usado para el eje de la gráfica?

En el eje X se encuentra el ID año y en eje Y se encuentra el ampo de In value

## 4. ¿Y en la leyenda?

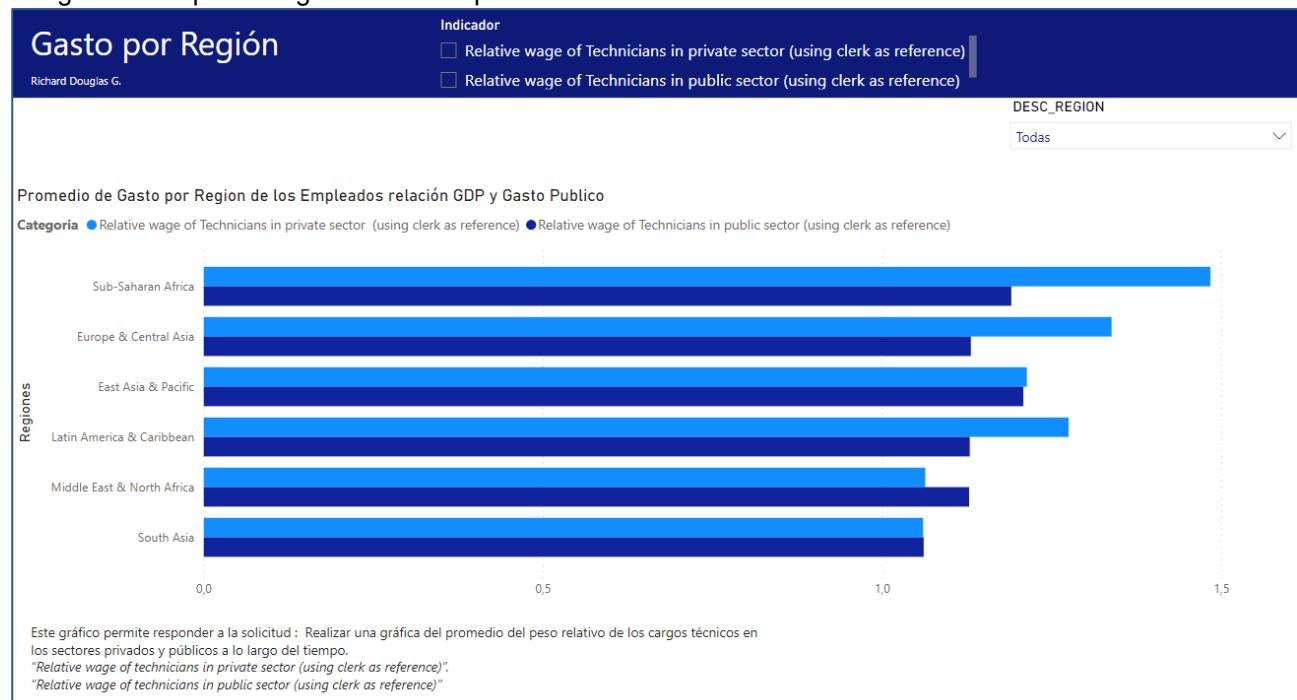
En la leyenda se encuentra Indicador Name

## Obtener el promedio del peso por región del gasto en empleados públicos respecto al GDP y el gasto público.

Las métricas que se han de usar son las siguientes:

“Wage bill as a percentage of GDP”.

“Wage bill as a percentage of Public Expenditure”.



### 1. ¿Qué tipo de gráfico se ha usado y por qué?

Este gráfico elegido es uno de barras agrupadas, por la preferencia en que permite comparar los dos valores por cada región, desde un punto óptico permite al usuario del gráfico identificar y distinguir fácilmente en cual categoría por región se invierte o gasta más.

### 2. ¿Qué campo se ha usado para filtrar los datos?

El campo que se utiliza para filtrar los datos corresponde a campo de Indicador Name

### 3.¿Qué campo se ha usado para el eje de la gráfica?

En el eje Y se utilizó la descripción de Region ,

### 4.¿Y en la leyenda?

En leyenda se coloca el campo de Inidcador Name

### 5. ¿Y en los valores?

en el eje X se utiliza el campo de In\_Value el cual contiene los valores necesarios para realizar la gráfica

## Paso a Paso del desarrollo del caso

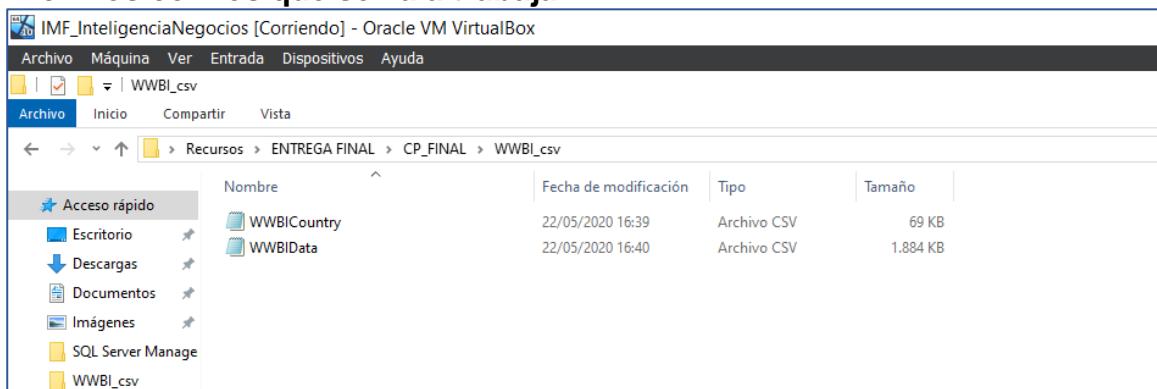
### SQL & Pentaho

En este apartado se encuentran las capturas que demuestran el desarrollo y solución del caso para ar respuesta a las preguntas puntuales.

#### 1. ¿Qué datos se usarán?

- Un análisis de los datos de origen en el que se detallen los campos que se encuentran en los ficheros.
- Se van a cargar a staging y al data mart, así como un diagrama entidad-relación del modelo.
- Un análisis de los datos de origen en el que se detallen los campos que se encuentran en los ficheros.

### Archivos con los que se va a trabajar



### Contenido del archivo wwbiccountry

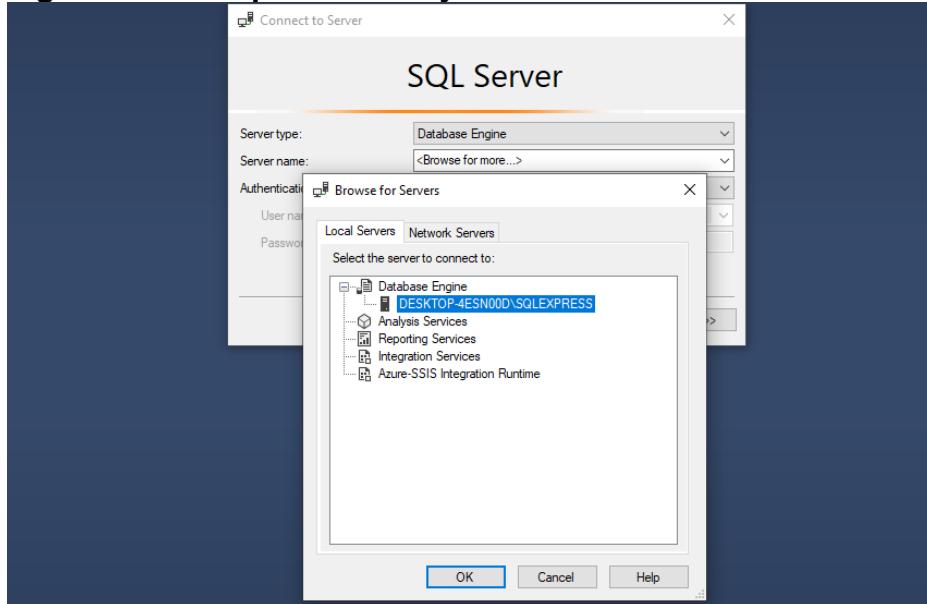
Una breve exploración de los archivos csv por medio de 20jedu

Table Name	Long Name	2-alpha code	Currency Unit	Special Notes	Region
Afghanistan	Islamic State of Afghanistan	AF	Afghan afghani	Fiscal year end: March 20; reporting period for national accounts data is calendar year, estimat South Asia	Sub-Saharan Africa
Angola	People's Republic of Angola	AO	Angolan kwanza		Middle East & North Africa
Argentina	Argentine Republic	AR	Argentine peso	National Institute of Statistics and Census revised national accounts from 2004-2015. Argentina Latin America & Caribbean	Latin America & Caribbean
Benin	Republic of Benin	BJ	West African CFA franc		Sub-Saharan Africa
Burkina Faso	Burkina Faso	BF	West African CFA franc		Sub-Saharan Africa
Bangladesh	People's Republic of Bangladesh	BD	Bangladeshi taka	Fiscal year end: June 30; reporting period for national accounts data: FY,	South Asia
Bolivia	Plurinational State of Bolivia	BO	Bolivian Bolíviano		Latin America & Caribbean
Bhutan	Kingdom of Bhutan	BT	Bhutanese ngultrum		South Asia
Botswana	Republic of Botswana	BW	Botswana pula	Fiscal year end: March 31; reporting period for national accounts data: CY. Based on official govt Sub-Saharan Africa	Sub-Saharan Africa
Central African Republic	Central African Republic	CF	Central African CFA franc	The source of national accounts has changed to the International Monetary Fund. The base year Sub-Saharan Africa	Middle East & North Africa
China	People's Republic of China	CN	Chinese yuan	On 1 July 1997 China resumed its exercise of sovereignty over Hong Kong; and on 20 December East Asia & Pacific	East Asia & Pacific
Cameroon	Republic of Cameroon	CM	Central African CFA franc	National accounts data revised from 1993-2016.	Sub-Saharan Africa
Congo, Rep.	Republic of Congo	CG	Central African CFA franc		Sub-Saharan Africa
Colombia	Republic of Colombia	CO	Colombian peso		Latin America & Caribbean
Comoros	Union of the Comoros	KM	Comorian franc		Sub-Saharan Africa
Cabo Verde	Republic of Cabo Verde	CV	Cabo Verde escudo	Cabo Verde is the name for the country previously listed as Cape Verde. Value added is measured Sub-Saharan Africa	Middle East & North Africa
Djibouti	Republic of Djibouti	DJ	Djibouti franc		Latin America & Caribbean
Dominican Republic	Dominican Republic	DO	Dominican peso	The Dominican Republic uses chain linked methodology.	Latin America & Caribbean
Ecuador	Republic of Ecuador	EC	U.S. dollar		Latin America & Caribbean
Egypt, Arab Rep.	Arab Republic of Egypt	EG	Egyptian pound	Fiscal year end: June 30; reporting period for national accounts data: FY.	Middle East & North Africa
Ethiopia	Federal Democratic Republic of Ethiopia	ET	Ethiopian birr	Fiscal year end: July 7; reporting period for national accounts data: FY.	Sub-Saharan Africa
Gabon	Gabonese Republic	GA	Central African CFA franc		Sub-Saharan Africa
Georgia	Georgia	GE	Georgian lari		Europe & Central Asia
Ghana	Republic of Ghana	GH	New Ghanaian cedi		Sub-Saharan Africa
Gambia, The	Republic of The Gambia	GM	Gambian dalasi	Fiscal year end: June 30; reporting period for national accounts data: CY. Value added is measured Sub-Saharan Africa	Middle East & North Africa
Guinea-Bissau	Republic of Guinea-Bissau	GW	West African CFA franc		Sub-Saharan Africa
Guatemala	Republic of Guatemala	GT	Guatemalan quetzal	The country uses chain linked methodology.	Latin America & Caribbean
Honduras	Republic of Honduras	HN	Honduran lempira		Latin America & Caribbean
Haiti	Republic of Haiti	HT	Haitian gourde	Fiscal year end: September 30; reporting period for national accounts data: FY.	Latin America & Caribbean
Jamaica	Jamaica	JM	Jamaican dollar		Latin America & Caribbean
Jordan	Hashemite Kingdom of Jordan	JO	Jordanian dinar	Expenditure data from 2010 removed as they are estimates.	Middle East & North Africa
Kosovo	Republic of Kosovo	KR	Kosovar dinar	Fiscal year end: June 30; reporting period for national accounts data: CY.	Sub-Saharan Africa

## Contenido del archivo wwbicdata

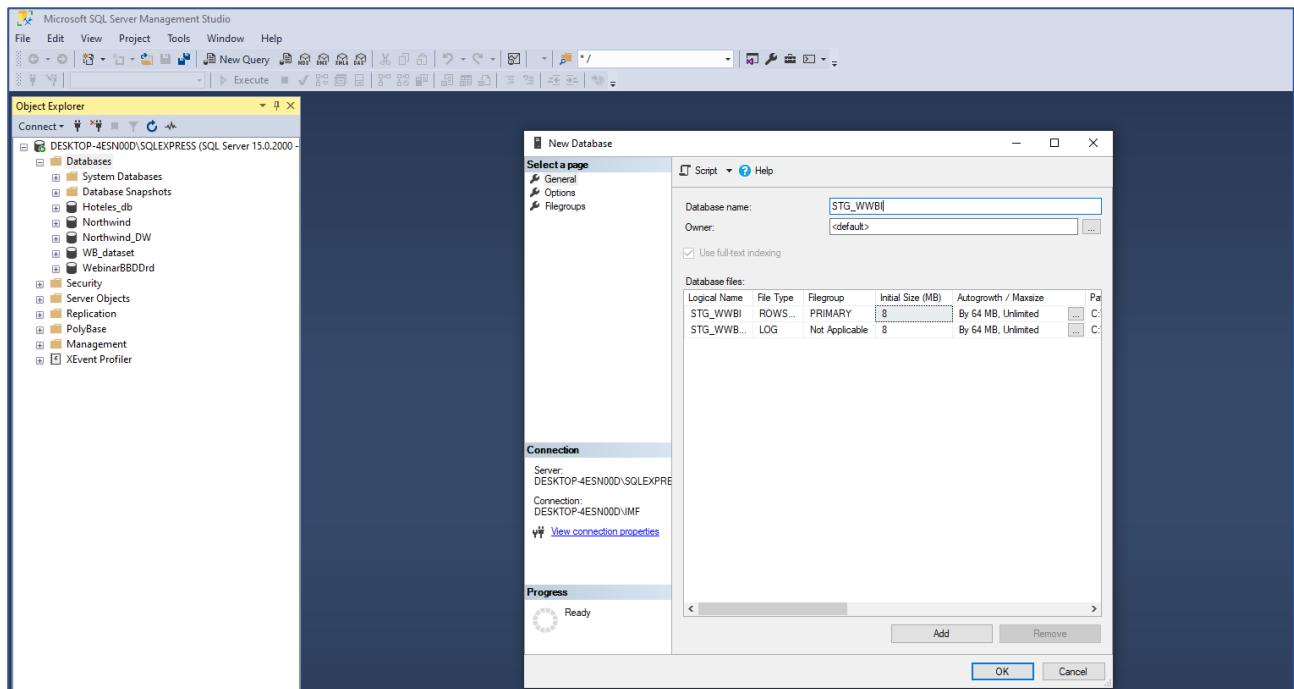
Country Name	Country Cd	Indicator Name	Indicator Code	a2000	a2001	a2002	a2003	a2004
Afghanistan	AFG	Females as a share of public paid employees by occupation (Clerks)	BI.PWK.PUBS.CK.FE.ZS					
Afghanistan	AFG	Females as a share of public paid employees by occupation (Elementary occupation)	BI.PWK.PUBS.EO.FE.ZS					
Afghanistan	AFG	Females as a share of public paid employees by occupation (Professionals)	BI.PWK.PUBS.PN.FE.ZS					
Afghanistan	AFG	Females as a share of public paid employees by occupation (Senior officials)	BI.PWK.PUBS.SN.FE.ZS					
Afghanistan	AFG	Females as a share of public paid employees by occupation (Technicians)	BI.PWK.PUBS.TN.FE.ZS					
Afghanistan	AFG	Females, as a share of private paid employee by wage quintile (Quintile 1)	BI.PWK.PRVS.FE.Q1.ZS					
Afghanistan	AFG	Females, as a share of private paid employee by wage quintile (Quintile 2)	BI.PWK.PRVS.FE.Q2.ZS					
Afghanistan	AFG	Females, as a share of private paid employee by wage quintile (Quintile 4)	BI.PWK.PRVS.FE.Q4.ZS					
Afghanistan	AFG	Females, as a share of private paid employee by wage quintile (Quintile 5)	BI.PWK.PRVS.FE.Q5.ZS					
Afghanistan	AFG	Females, as a share of public paid employees by wage quintile (Quintile 1)	BI.PWK.PUBS.FE.Q1.ZS					
Afghanistan	AFG	Females, as a share of public paid employee by wage quintile (Quintile 2)	BI.PWK.PUBS.FE.Q2.ZS					
Afghanistan	AFG	Females, as a share of public paid employees by wage quintile (Quintile 3)	BI.PWK.PUBS.FE.Q3.ZS					
Afghanistan	AFG	Females, as a share of public paid employee by wage quintile (Quintile 4)	BI.PWK.PUBS.FE.Q4.ZS					
Afghanistan	AFG	Females, as a share of public paid employees by wage quintile (Quintile 5)	BI.PWK.PUBS.FE.Q5.ZS					
Afghanistan	AFG	Females, as a share of public paid employees	BI.PWK.PUBS.FE.ZS					
Afghanistan	AFG	Individuals with no education as a share of private paid employees	BI.PWK.PRVS.NN.ZS					
Afghanistan	AFG	Individuals with primary education as a share of public paid employees	BI.PWK.PUBS.PR.ZS					
Afghanistan	AFG	Individuals with primary education as a share of public paid employees	BI.PWK.PUBS.PR.ZS					
Afghanistan	AFG	Individuals with secondary education as a share of private paid employees	BI.PWK.PRVS.SG.ZS					
Afghanistan	AFG	Individuals with secondary education as a share of public paid employees	BI.PWK.PUBS.SG.ZS					
Afghanistan	AFG	Individuals with tertiary education as a share of private paid employees	BI.PWK.PRVS.TT.ZS					
Afghanistan	AFG	Individuals with tertiary education as a share of public paid employees	BI.PWK.PUBS.TT.ZS					
Afghanistan	AFG	Mean age of private paid employees	BI.PWK.AGES.PV.SM					
Afghanistan	AFG	Median age of private paid employees	BI.PWK.AGES.PB.MD					
Afghanistan	AFG	Median age of public paid employees	BI.PWK.AGES.PB.MD					
Afghanistan	AFG	Number of employed individuals	BI.EMP.TOTL.NO				16949	
Afghanistan	AFG	Number of paid employees	BI.PWK.TOTL.NO				4014	
Afghanistan	AFG	Number of public paid employees	BI.PWK.PUBS.NO				935	
Afghanistan	AFG	Pay compression ratio in private sector	BI.WAG.CPRS.PV.ZS					
Afghanistan	AFG	Pay compression ratio in public sector	BI.WAG.CPRS.PB.ZS					
Afghanistan	AFG	Proportion of total employees with tertiary education working in public sector	BI.EMP.TOTL.PB.TT.ZS					
Afghanistan	AFG	Public sector employment as a share of formal employment	BI.EMP.FRML.PB.ZS					
Afghanistan	AFG	Public sector employment as a share of paid employment	BI.EMP.PWRK.PB.ZS					
							0.329382449388504	

## Ingreso a la maquina virtual y acceso a SQL Server

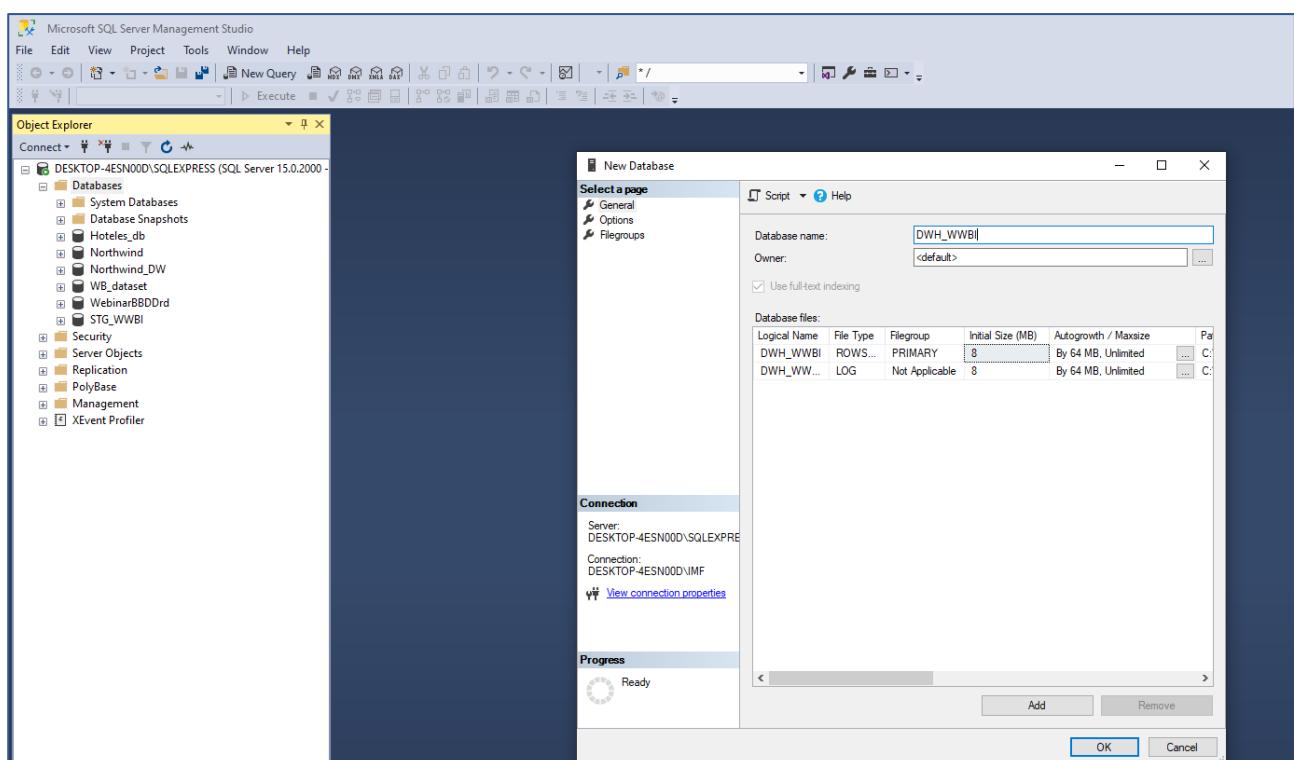


## Creacion de las bases de datos

### Staging

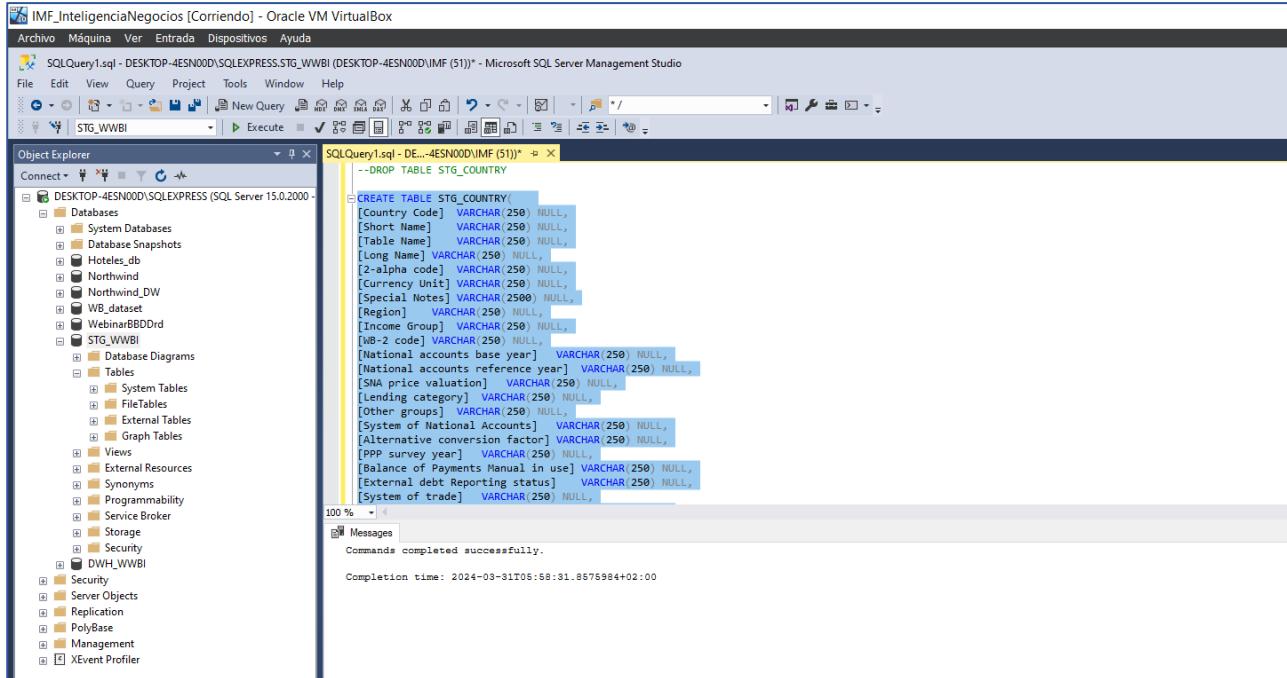


### Base warehouse



## Creación de las tablas en SQL Server

### • Tablas de base staging

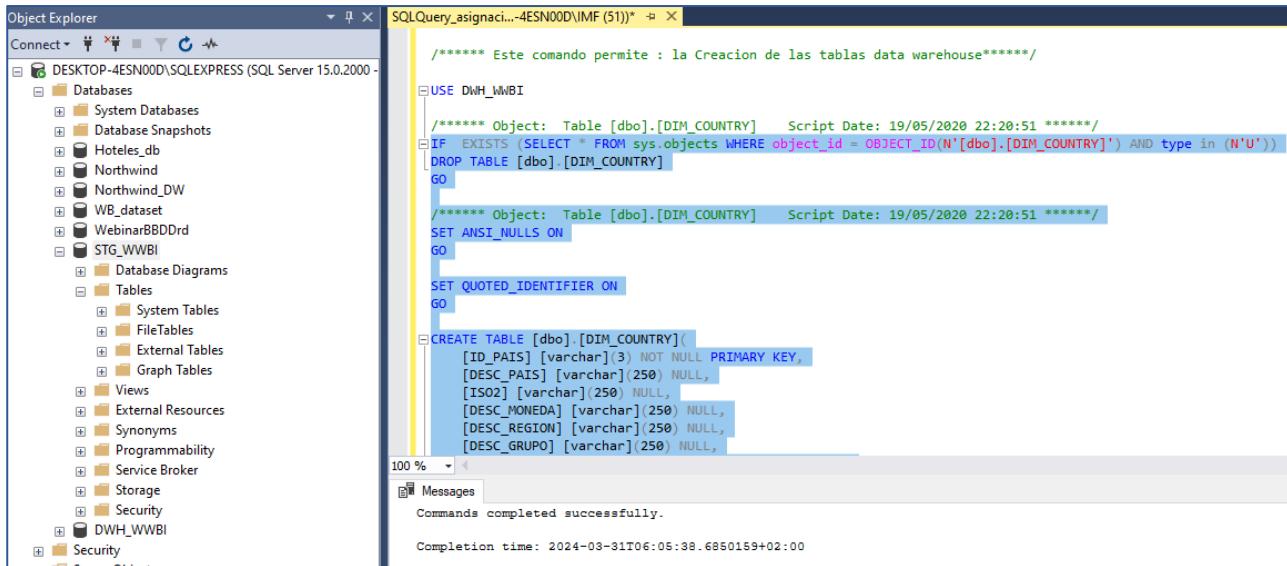


The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists databases like DESKTOP-4ESN00D\SQLEXPRESS and STG\_WWBI. The central pane displays a query window titled 'SQLQuery1.sql - DESKTOP-4ESN00D\SQLEXPRESS.STG\_WWBI (DESKTOP-4ESN00D\IMF (51))' containing the following T-SQL code:

```
--DROP TABLE STG_COUNTRY
CREATE TABLE STG_COUNTRY(
[Country Code] VARCHAR(250) NULL,
[Short Name] VARCHAR(250) NULL,
[Table Name] VARCHAR(250) NULL,
[Long Name] VARCHAR(250) NULL,
[2-alpha code] VARCHAR(250) NULL,
[Currency Unit] VARCHAR(250) NULL,
[Special Notes] VARCHAR(2500) NULL,
[Region] VARCHAR(250) NULL,
[Income Group] VARCHAR(250) NULL,
[WB-2 code] VARCHAR(250) NULL,
[National accounts base year] VARCHAR(250) NULL,
[National accounts reference year] VARCHAR(250) NULL,
[SNA price valuation] VARCHAR(250) NULL,
[Lending category] VARCHAR(250) NULL,
[Other groups] VARCHAR(250) NULL,
[System of National Accounts] VARCHAR(250) NULL,
[Alternative conversion factor] VARCHAR(250) NULL,
[PPP survey year] VARCHAR(250) NULL,
[Balance of Payments Manual in use] VARCHAR(250) NULL,
[External debt Reporting status] VARCHAR(250) NULL,
[System of trade] VARCHAR(250) NULL)
```

The 'Messages' pane at the bottom indicates 'Commands completed successfully.' with a completion time of 2024-03-31T05:58:31.8575984+02:00.

### • Tablas de base Data warehouse



The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left lists databases like DESKTOP-4ESN00D\SQLEXPRESS and DWH\_WWBI. The central pane displays a query window titled 'SQLQuery\_asignacion...-4ESN00D\IMF (51)' containing the following T-SQL code:

```
***** Este comando permite : la Creacion de las tablas data warehouse*****
USE DWH_WWBI
***** Object: Table [dbo].[DIM_COUNTRY] Script Date: 19/05/2020 22:20:51 *****
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[DIM_COUNTRY]') AND type in (N'U'))
DROP TABLE [dbo].[DIM_COUNTRY]
GO

***** Object: Table [dbo].[DIM_COUNTRY] Script Date: 19/05/2020 22:20:51 *****
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[DIM_COUNTRY](
    [ID_PAIS] [varchar](3) NOT NULL PRIMARY KEY,
    [DESC_PAIS] [varchar](250) NULL,
    [ISO2] [varchar](250) NULL,
    [DESC_MONEDA] [varchar](250) NULL,
    [DESC_REGION] [varchar](250) NULL,
    [DESC_GRUPO] [varchar](250) NULL,
```

The 'Messages' pane at the bottom indicates 'Commands completed successfully.' with a completion time of 2024-03-31T06:05:38.6850159+02:00.

```

***** Este comando permite : conocer la estructura de la base de datos *****/
SELECT
    *
FROM
    information_schema.tables;

100 % <
Results Messages


|   | TABLE_CATALOG | TABLE_SCHEMA | TABLE_NAME  | TABLE_TYPE |
|---|---------------|--------------|-------------|------------|
| 1 | STG_WWBI      | dbo          | STG_COUNTRY | BASE TABLE |
| 2 | STG_WWBI      | dbo          | STG_DATA    | BASE TABLE |

***** Este comando permite : conocer la estructura de la base de datos *****/
SELECT
    *
FROM
    information_schema.tables;

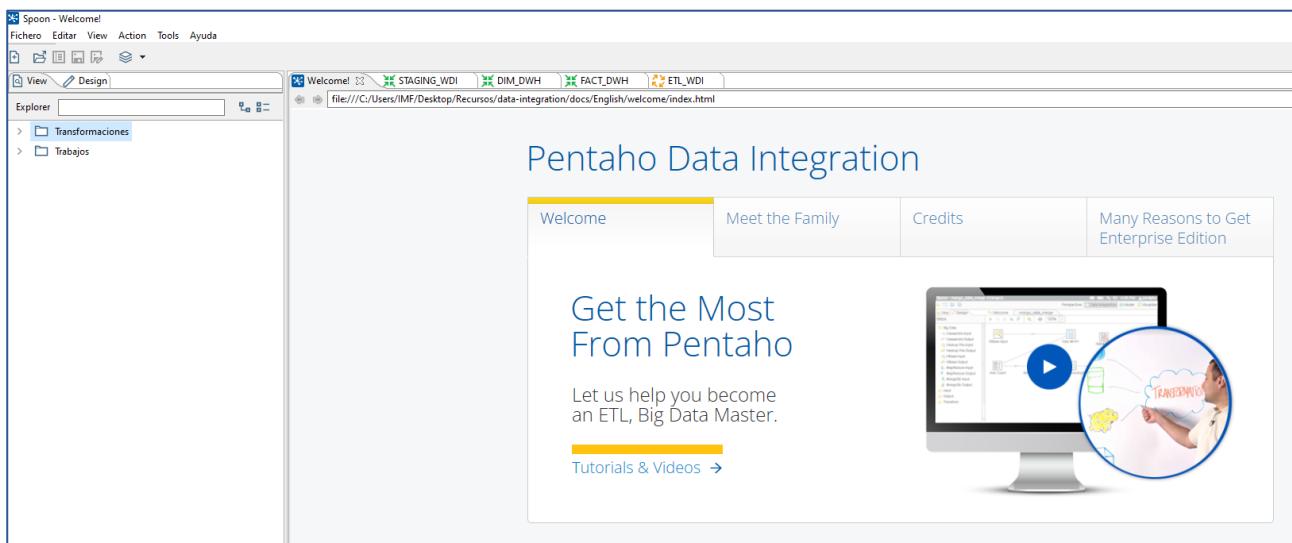
100 % <
Results Messages


|   | TABLE_CATALOG | TABLE_SCHEMA | TABLE_NAME   | TABLE_TYPE |
|---|---------------|--------------|--------------|------------|
| 1 | DWH_WWBI      | dbo          | DIM_COUNTRY  | BASE TABLE |
| 2 | DWH_WWBI      | dbo          | DIM_METRICAS | BASE TABLE |
| 3 | DWH_WWBI      | dbo          | FACT_WDI     | BASE TABLE |

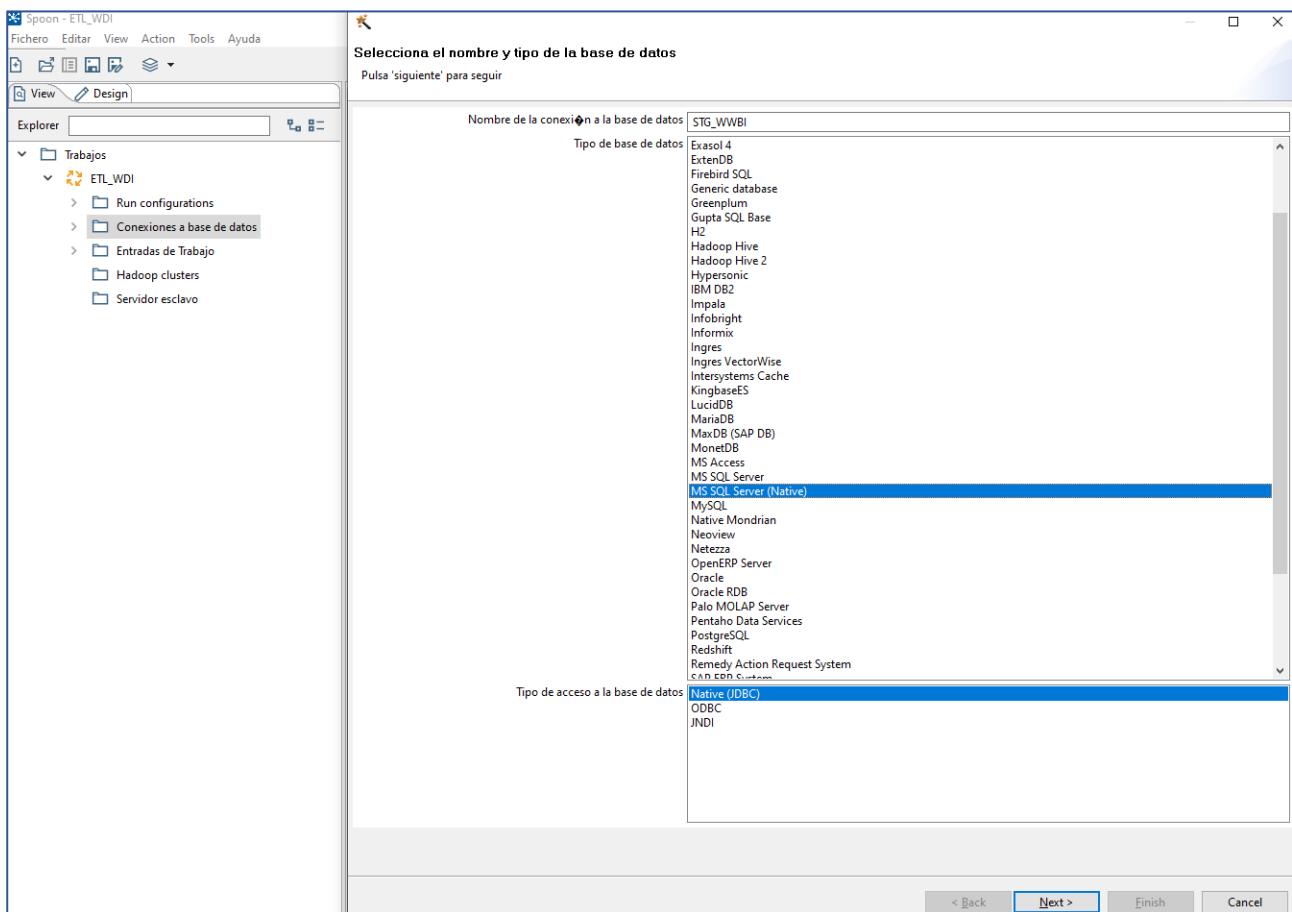

```

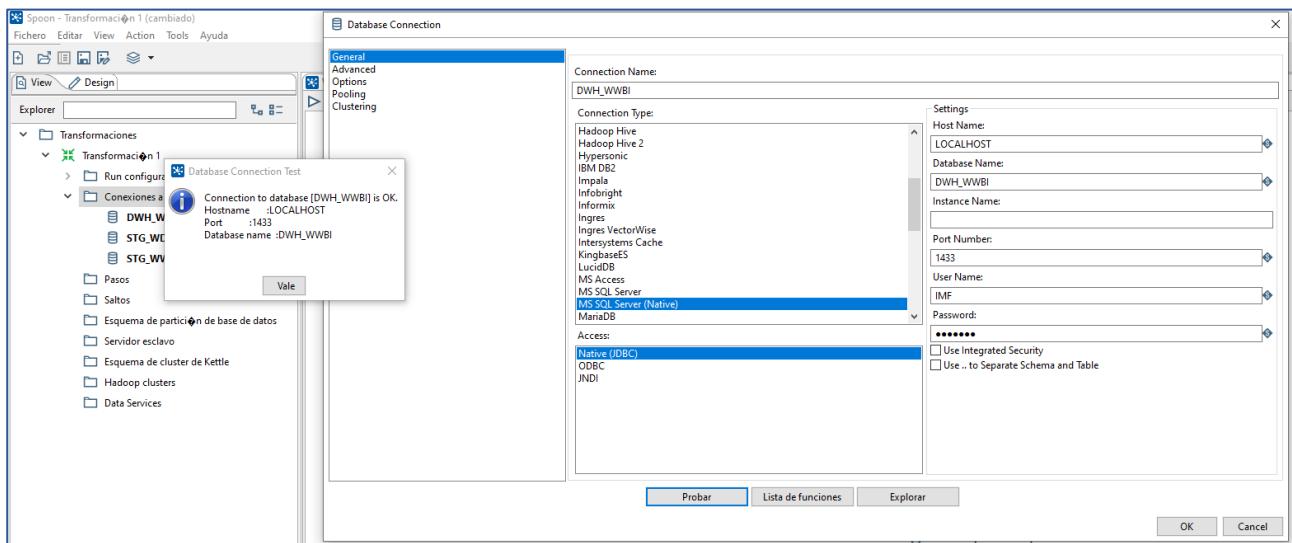
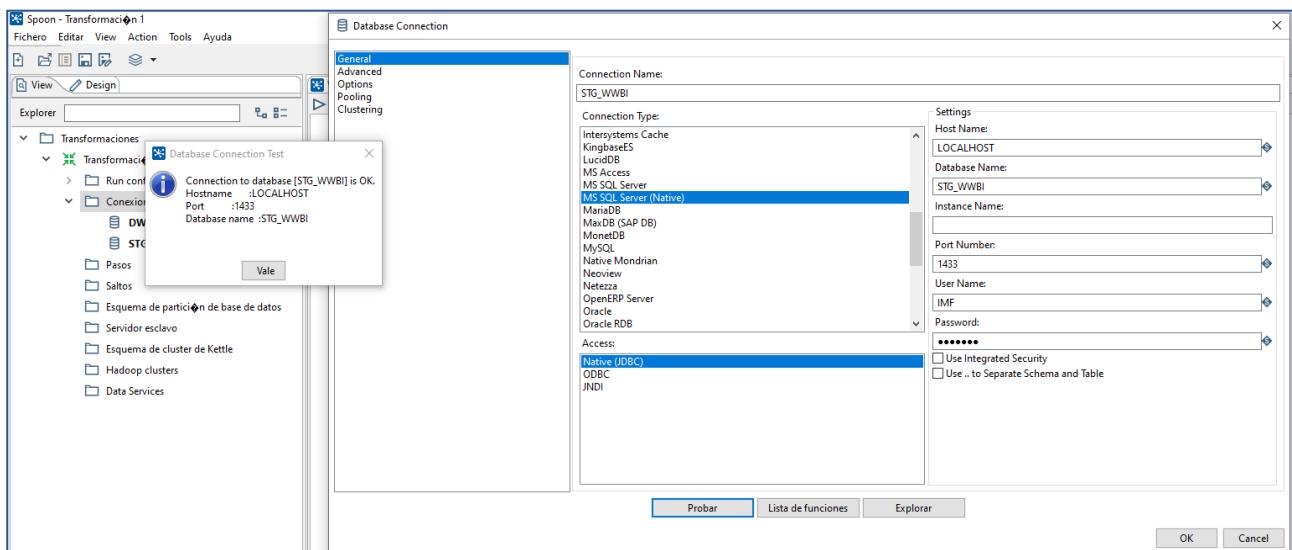
## Acceso a Pentaho





## Crear la conexión con pentaho y SQL





## Crear una entrada

**CSV Input**

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group
23	IMF data dissemination standard	String		51		€	,	.
24	Latest population census	String		166		€	,	.
25	Latest household survey	String		73		€	,	.
26	Source of most recent income and expenditure data	String		90		€	,	.
27	Vital registration complete	String		3		€	,	.
28	Latest agricultural census	String	#	15	0	€	,	.
29	Latest industrial data	String	#	15	0	€	,	.
30	Latest trade data	String	#	15	0	€	,	.

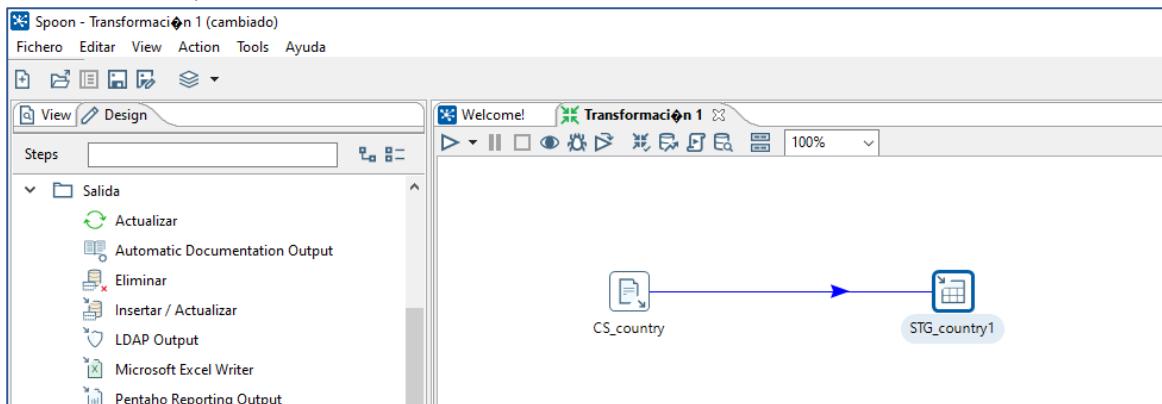
**Salida de Tabla**

Nombre paso:	STG_country1
Conexión:	STG_WWBI
Esquema destino:	
Tabla destino:	STG_COUNTRY
Tamaño transacción (commit):	1000
Vaciar tabla:	<input checked="" type="checkbox"/>
Ignorar errores de inserción:	<input type="checkbox"/>
Specify database fields:	<input type="checkbox"/>

**Main options** **Database fields**

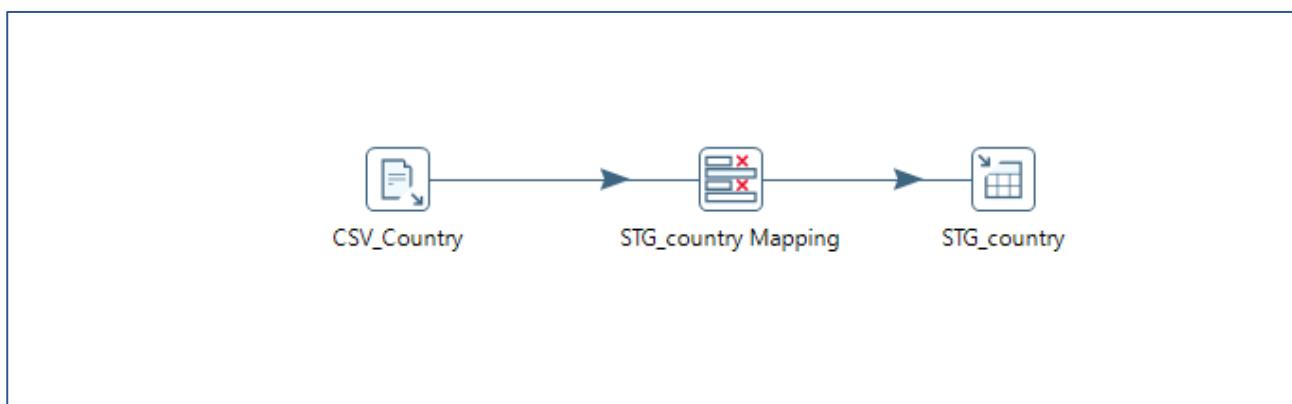
- Repartir información en varias tablas
- Campo de partición:
- Partitionar información por mes
- Partitionar información por días
- Utilizar actualización por lotes para inserciones
- El nombre de la tabla está definido en un campo?
- Campo que contiene el nombre de la tabla:
- Almacena el campo con el nombre de tabla
- Incluir clave auto-generada
- Nombre del campo clave auto-generada:

## Se crea una conexión entre la entrada del archivo csv y la salida que es una carga de una tabla SQL



## Crear un mapeo de los campos de entrada a la salida de tabla

The screenshot shows the 'Enter Mapping' dialog box. On the left, under 'Source fields:', there is a large list of fields from a CSV file, many of which have '(CSV\_Country)' typed after them. On the right, under 'Target fields:', there is a list of fields from a database table. Below these lists are two checkboxes: 'Auto target selection?' and 'Hide assigned source fields?'. At the bottom right are buttons for 'Vale', 'Guess', and 'Cancelar'.



Selecciona/Renombra valores

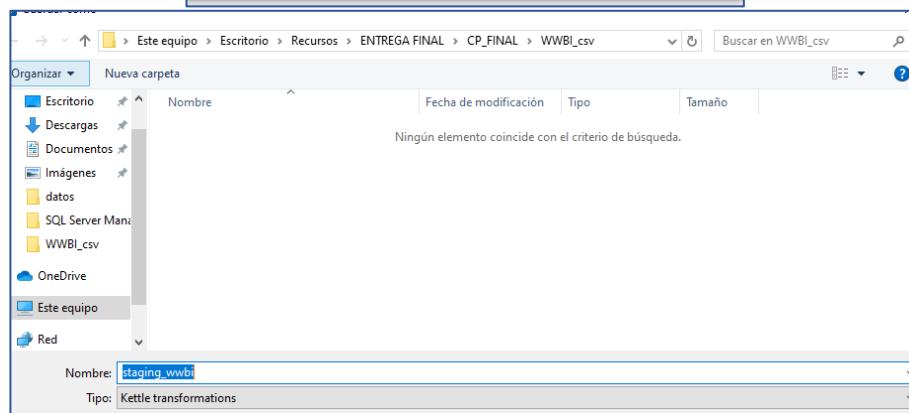
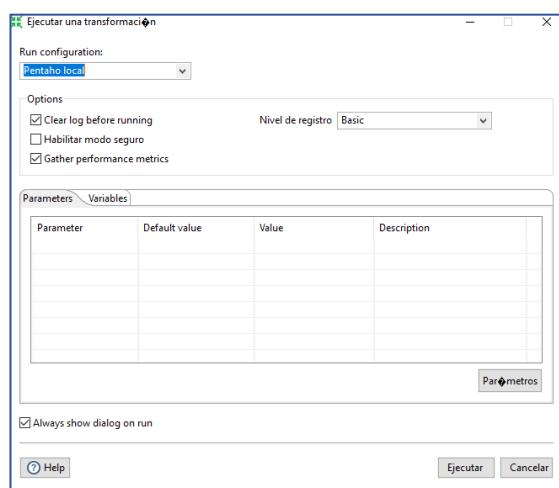
Nombre paso: STG\_country Mapping

Selección & Modifica | Eliminar | Meta-information

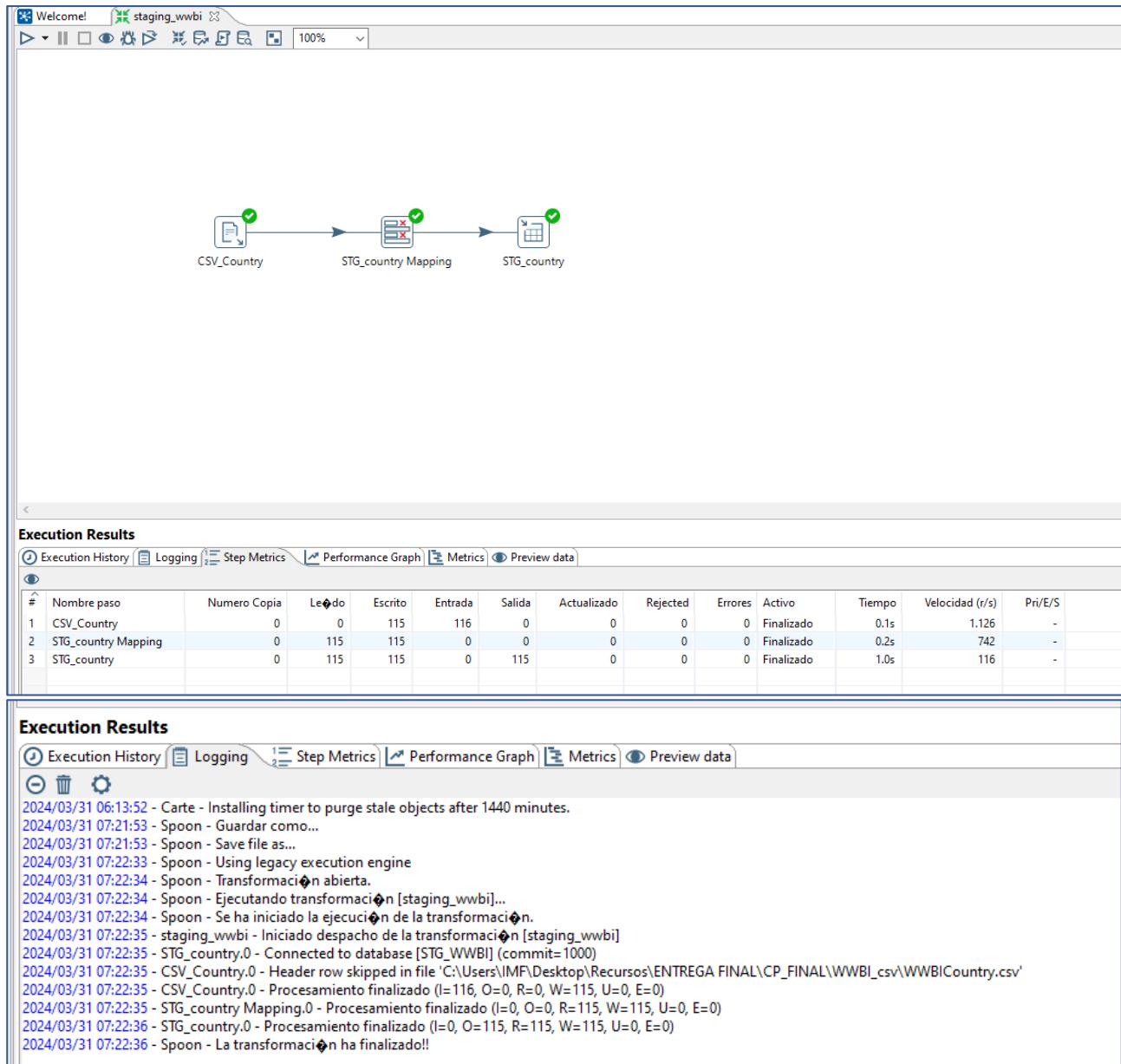
Campos:

#	Nombre campo	Renombrar a	Longitud	Precisión	
1	Short Name				
2	Table Name				
3	Long Name				
4	2-alpha code				
5	Currency Unit				
6	Special Notes				
7	Region				
8	Income Group				
9	WB-2 code				
10	National accounts base year				
11	National accounts reference year				
12	SNA price valuation				
13	Lending category				
14	Other groups				
15	System of National Accounts				
16	Alternative conversion factor				
17	PPP survey year				
18	Balance of Payments Manual in use				
19	External debt Reporting status				
20	System of trade				
21	Government Accounting concept				
22	IMF data dissemination standard				
23	Latest population census				
24	Latest household survey				
25	Source of most recent income and expenditure data				
26	Vital registration complete				
27	Latest agricultural census				
28	Latest industrial data				
29	Latest trade data				
30	Is "Country Code"	Country Code			

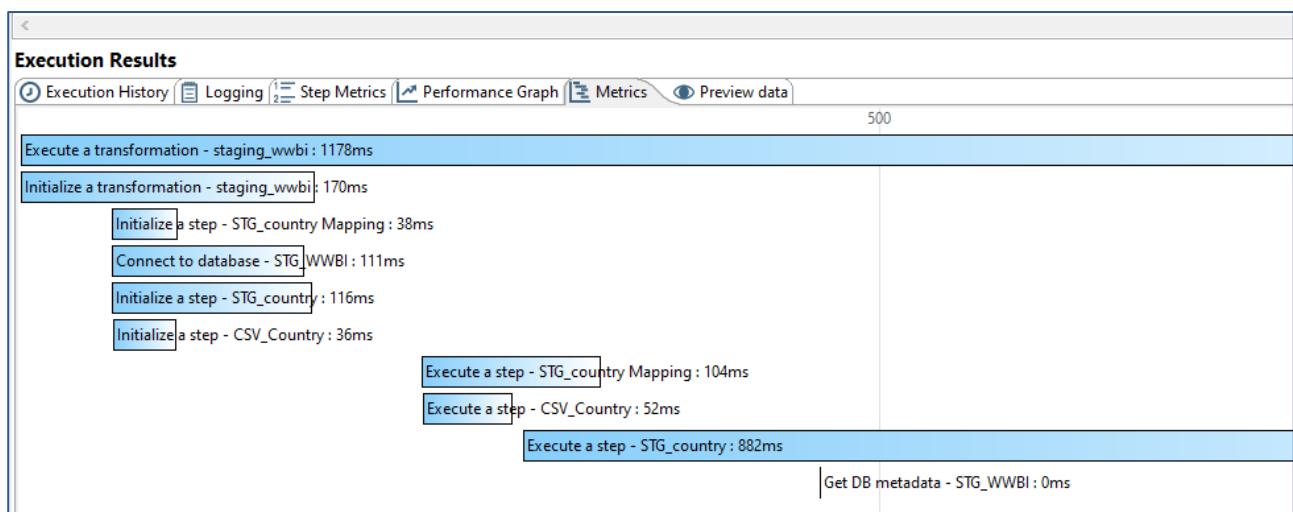
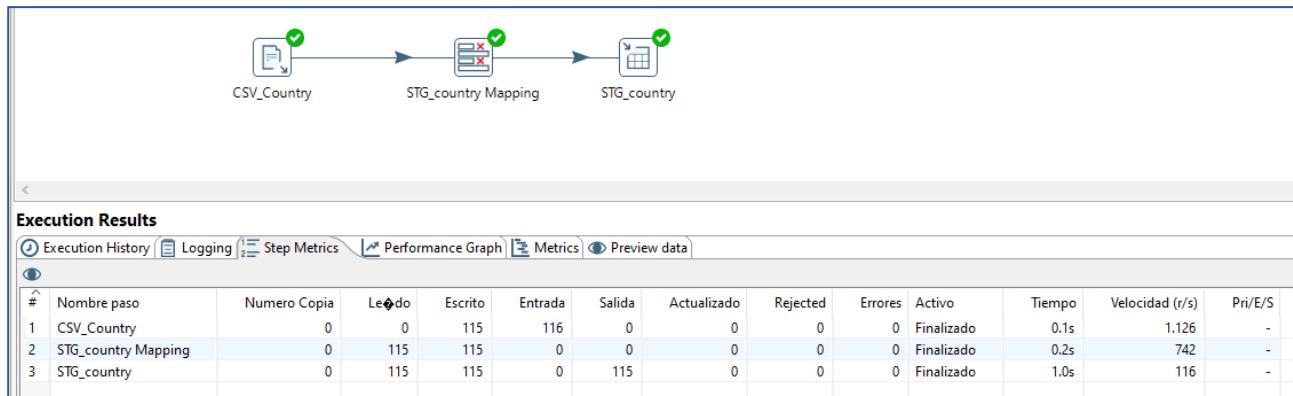
Include unspecified fields, ordered by name



## 30jecución30ió de funcionamiento del proceso creado : entrada de un csv y salida de en una tabla SQL



## Cantidad de datos cargados durante el proceso

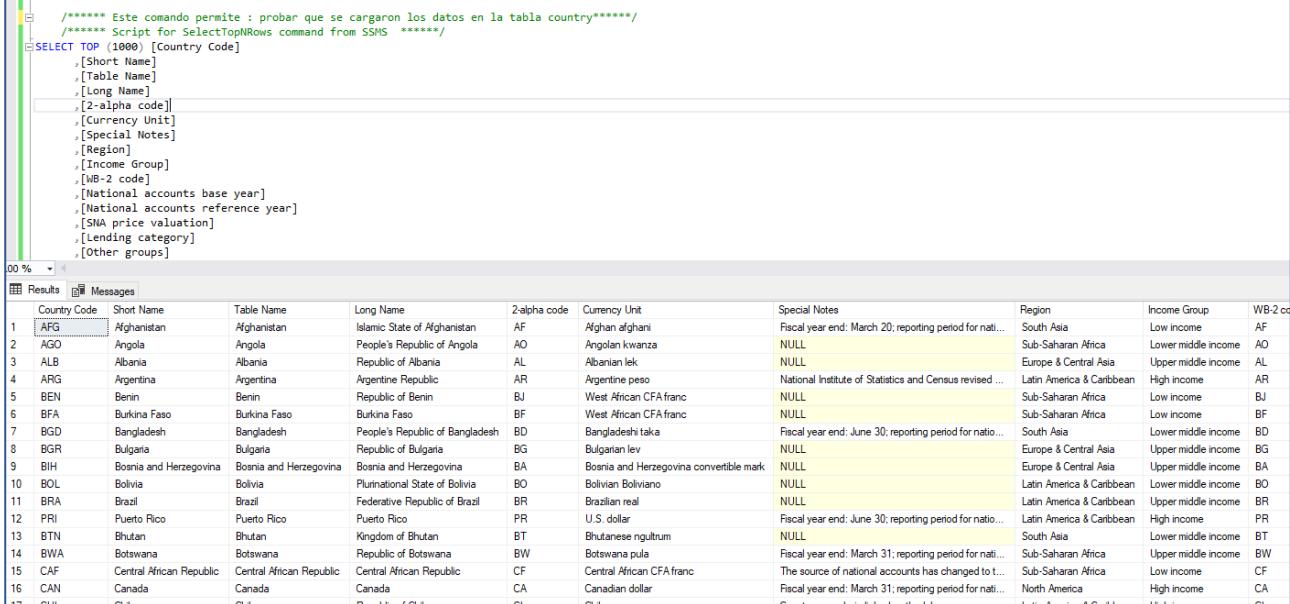


## Datos cargados en la tabla SQL

\*\*\*\*\* Este comando permite : probar que se cargaron los datos en la tabla country\*\*\*\*\*  
 SELECT TOP (1000) [Country Code]

- [Short Name]
- [Table Name]
- [Long Name]
- [2-alpha code]
- [Currency Unit]
- [Special Notes]
- [Region]
- [Income Group]
- [WB-2 code]
- [National accounts base year]
- [National accounts reference year]
- [SNA price valuation]
- [Lending category]
- [Other groups]
- [System of National Accounts]
- [Alternative conversion factor]
- [PPP survey year]
- [Balance of Payments Manual in use]
- [External debt Reporting status]
- [System of trade]
- [Government Accounting concept]
- [IMF data dissemination standard]
- [Latest population census]
- [Latest household survey]
- [Source of most recent Income and expenditure data]
- [Vital registration complete]
- [Latest agricultural census]
- [Latest industrial data]
- [Latest trade data]

FROM [STG\_WWB1].[dbo].[STG\_COUNTRY]



```

/*
Este comando permite : probar que se cargaron los datos en la tabla country*****
Script for SelectTopNRows command from SSMS *****/
SELECT TOP (1000) [Country Code]
,[Short Name]
,[Table Name]
,[Long Name]
,[2-alpha code]
,[Currency Unit]
,[Special Notes]
,[Region]
,[Income Group]
,[WB-2 code]
,[National accounts base year]
,[National accounts reference year]
,[SNA price valuation]
,[Lending category]
,[Other groups]
FROM [STG_WWB1].[dbo].[STG_COUNTRY]

```

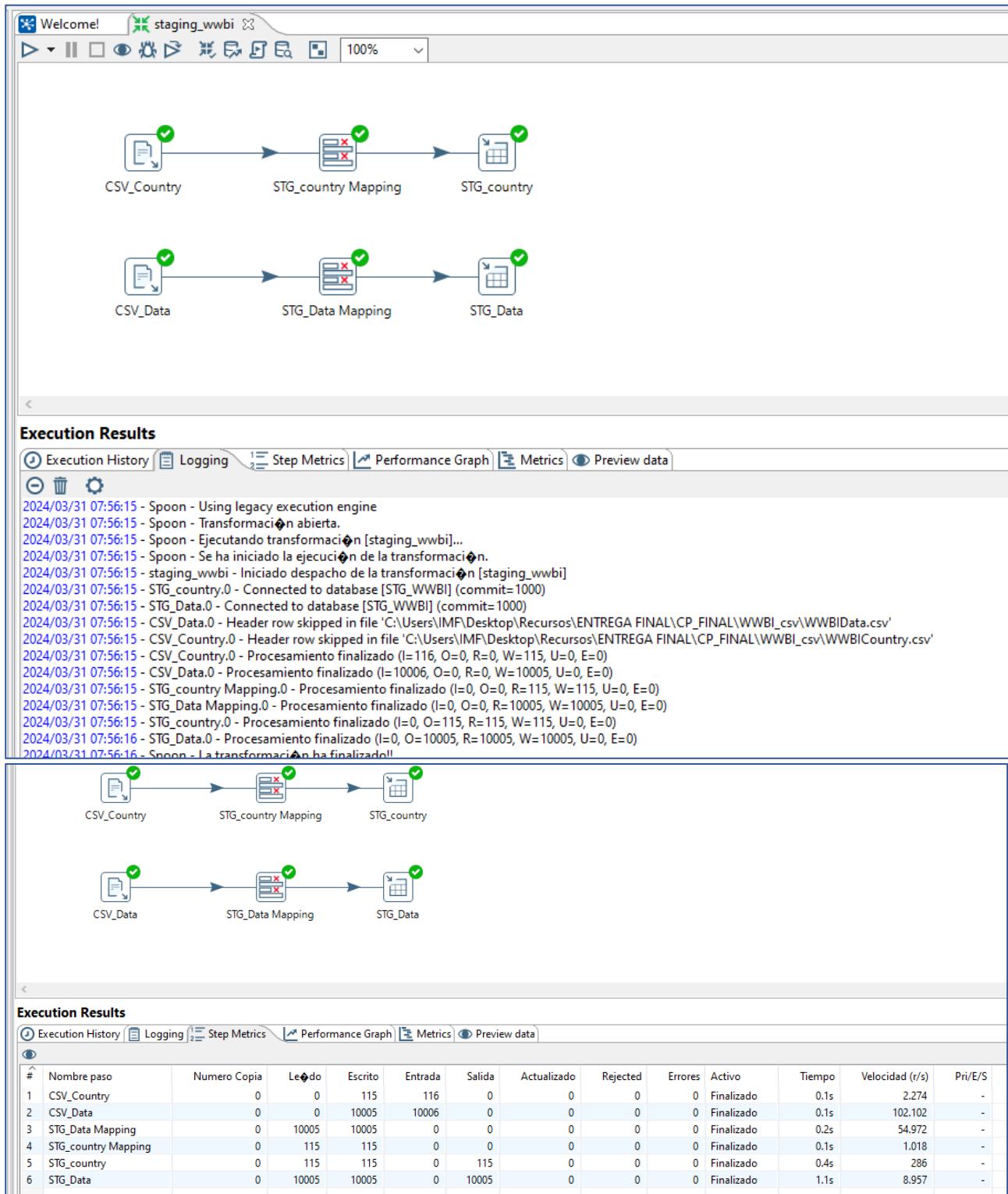
	Country Code	Short Name	Table Name	Long Name	2-alpha code	Currency Unit	Special Notes	Region	Income Group	WB-2 code
1	AFG	Afghanistan	Afghanistan	Islamic State of Afghanistan	AF	Afghan afghani	Fiscal year end: March 20; reporting period for nat...	South Asia	Low income	AF
2	AGO	Angola	Angola	People's Republic of Angola	AO	Angolan kwanza	NULL	Sub-Saharan Africa	Lower middle income	AO
3	ALB	Albania	Albania	Republic of Albania	AL	Albanian lek	NULL	Europe & Central Asia	Upper middle income	AL
4	ARG	Argentina	Argentina	Argentine Republic	AR	Argentine peso	National Institute of Statistics and Census revised ...	Latin America & Caribbean	High income	AR
5	BEN	Benin	Benin	Republic of Benin	BJ	West African CFA franc	NULL	Sub-Saharan Africa	Low income	BJ
6	BFA	Burkina Faso	Burkina Faso	Burkina Faso	BF	West African CFA franc	NULL	Sub-Saharan Africa	Low income	BF
7	BGD	Bangladesh	Bangladesh	People's Republic of Bangladesh	BD	Bangladeshi taka	Fiscal year end: June 30; reporting period for natio...	South Asia	Lower middle income	BD
8	BGR	Bulgaria	Bulgaria	Republic of Bulgaria	BG	Bulgarian lev	NULL	Europe & Central Asia	Upper middle income	BG
9	BIH	Bosnia and Herzegovina	Bosnia and Herzegovina	Bosnia and Herzegovina	BA	Bosnia and Herzegovina convertible mark	NULL	Europe & Central Asia	Upper middle income	BA
10	BOL	Bolivia	Bolivia	Plurinational State of Bolivia	BO	Bolivian Boliviano	NULL	Latin America & Caribbean	Lower middle income	BO
11	BRA	Brazil	Brazil	Federative Republic of Brazil	BR	Brazilian real	NULL	Latin America & Caribbean	Upper middle income	BR
12	PRI	Puerto Rico	Puerto Rico	Puerto Rico	PR	U.S. dollar	Fiscal year end: June 30; reporting period for natio...	Latin America & Caribbean	High income	PR
13	BTN	Bhutan	Bhutan	Kingdom of Bhutan	BT	Bhutanese ngultrum	NULL	South Asia	Lower middle income	BT
14	BWA	Botswana	Botswana	Republic of Botswana	BW	Botswana pula	Fiscal year end: March 31; reporting period for nat...	Sub-Saharan Africa	Upper middle income	BW
15	CAF	Central African Republic	Central African Republic	Central African Republic	CF	Central African CFA franc	The source of national accounts has changed to...	Sub-Saharan Africa	Low income	CF
16	CAN	Canada	Canada	Canada	CA	Canadian dollar	Fiscal year end: March 31; reporting period for nat...	North America	High income	CA

**CSV Input**

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Trim type
7	a2002	String							
8	a2003	String							
9	a2004	String							
10	a2005	String							
11	a2006	String							
12	a2007	String							
13	a2008	String							
14	a2009	String							
15	a2010	String							

**Salida de Tabla**

Nombre paso:	STG_Data
Conexión:	STG_WWB1
Esquema destino:	
Tabla destino:	STG_DATA
Tamaño transacción (commit):	1000
Vaciar tabla:	<input checked="" type="checkbox"/>
Ignorar errores de inserción:	<input type="checkbox"/>
Specify database fields:	<input type="checkbox"/>
Main options	Database fields
Repartir información en varias tablas:	<input type="checkbox"/>
Campo de partición:	
Particionar información por mes:	<input checked="" type="radio"/>
Particionar información por días:	<input type="radio"/>
Utilizar actualización por lotes para inserciones:	<input checked="" type="checkbox"/>
El nombre de la tabla está definido en un campo?	<input type="checkbox"/>
Campo que contiene el nombre de la tabla:	
Almacena el campo con el nombre de tabla:	<input checked="" type="checkbox"/>
Incluye clave auto-generada:	<input type="checkbox"/>
Nombre del campo clave auto-generada:	



SQLQuery3.sql - DE...4ESN0ODUMF (54) □ X SQLQuery10.sql - D...4ESN0ODU(MF (57))

```
/*===== Script for SelectTopNRows command from SSMS =====*/
SELECT TOP (1000) [Country Name]
      ,[Country Code]
      ,[Indicator Name]
      ,[Indicator Code]
      ,[a2000]
      ,[a2001]
      ,[a2002]
      ,[a2003]
      ,[a2004]
      ,[a2005]
      ,[a2006]
      ,[a2007]
      ,[a2008]
      ,[a2009]
      ,[a2010]
      ,[a2011]
      ,[a2012]
      ,[a2013]
      ,[a2014]
      ,[a2015]
      ,[a2016]
      ,[a2017]
      ,[a2018]
```

100 %

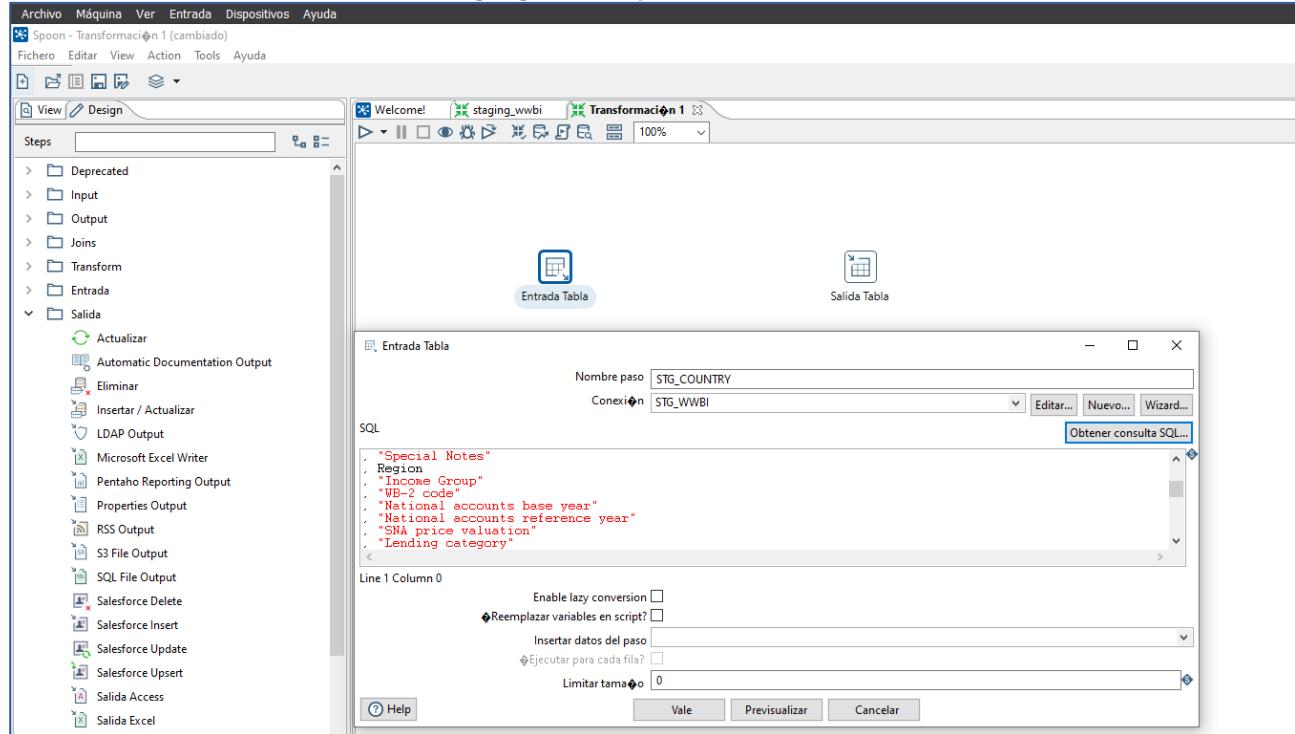
Results Messages

Country Name	Country Code	Indicator Name	Indicator Code	a2000	a2001	a2002	a2003	a2004	a2005	a2006	a2007	a2008	a2009	a2010	a2011	a2012	a2013	a2014	a2015	a2016	a2017	a2018
256 Angola	AGO	Share of public paid employees with a contract	BI.PWK.PUBS.CT.ZS	NULL	NULL																	
257 Angola	AGO	Share of public paid employees with health insurance	BI.PWK.PUBS.HS.ZS	NULL	NULL																	
258 Angola	AGO	Share of public paid employees with social security	BI.PWK.PUBS.SY.ZS	NULL	NULL																	
259 Angola	AGO	Share of public paid employees with union membership	BI.PWK.PUBS.UM.ZS	NULL	NULL																	
260 Angola	AGO	Wage bill as a percentage of GDP	BI.WAG.TOTL.GD.ZS	NULL	10.2...	NULL	NULL	NULL	NULL	NULL												
261 Angola	AGO	Wage bill as a percentage of Public Expenditure	BI.WAG.TOTL.PB.ZS	NULL	24.9...	NULL	NULL	NULL	NULL	NULL												
262 Argentina	ARG	Female to male wage ratio in the private sector (usd)	BI.WAG.PRVS.FM.SM	0.70...	0.72...	0.67...	0.72...	0.68...	0.67...	0.64...	0.61...	0.64...	0.68...	0.66...	0.65...	0.67...	0.68...	NULL	NULL	NULL	NULL	
263 Argentina	ARG	Female to male wage ratio in the private sector (usd)	BI.WAG.PRVS.FM.MD	0.72...	0.77...	0.66...	0.69...	0.66...	0.64...	0.63...	0.58...	0.61...	0.66...	0.64...	0.60...	0.58...	0.65...	0.63...	NULL	NULL	NULL	NULL
264 Argentina	ARG	Female to male wage ratio in the public sector (usd)	BI.WAG.PUBS.FM.SM	0.78...	0.77...	0.73...	0.85...	0.83...	0.84...	0.85...	0.81...	0.84...	0.85...	0.87...	0.87...	0.87...	0.87...	0.84...	0.85...	0.85...	NULL	NULL
265 Argentina	ARG	Female to male wage ratio in the public sector (usd)	BI.WAG.PUBS.FM.MD	0.83...	0.78...	0.70...	0.76...	0.80...	0.84...	0.83...	0.80...	0.87...	0.87...	0.89...	0.84...	0.83...	0.83...	0.86...	0.86...	NULL	NULL	NULL
266 Argentina	ARG	Females as a share of private paid employee by w...	BI.PWK.PRVS.FE.Q3.ZS	NULL	NULL	NULL																
267 Argentina	ARG	Females as a share of private paid employees	BI.PWK.PRVS.FE.ZS	0.39...	0.40...	0.41...	0.42...	0.41...	0.41...	0.42...	0.41...	0.42...	0.42...	0.43...	0.41...	0.41...	0.41...	0.41...	0.42...	0.42...	NULL	NULL
268 Argentina	ARG	Females as a share of private paid employees by o...	BI.PWK.PRVS.CK.FE.ZS	NULL	NULL	NULL																
269 Argentina	ARG	Females as a share of private paid employees by o...	BI.PWK.PRVS.EO.FE.ZS	NULL	NULL	NULL																
270 Argentina	ARG	Females as a share of private paid employees by o...	BI.PWK.PRVS.PN.FE.ZS	NULL	NULL	NULL																
271 Argentina	ARG	Females as a share of private paid employees by o...	BI.PWK.PRVS.SN.FE.ZS	NULL	NULL	NULL																
272 Argentina	ARG	Females as a share of private paid employees by o...	BI.PWK.PRVS.TN.FE.ZS	NULL	NULL	NULL																

## Creación de tablas de métricas

Primero se crea una entrada de tabla y posteriormente una salida de tabla, esta última corresponde a la tabla previamente creada en SQL Server como la tabla definitiva o tabla del Data Warehouse

### Creación de la entrada de tabla Staging Country



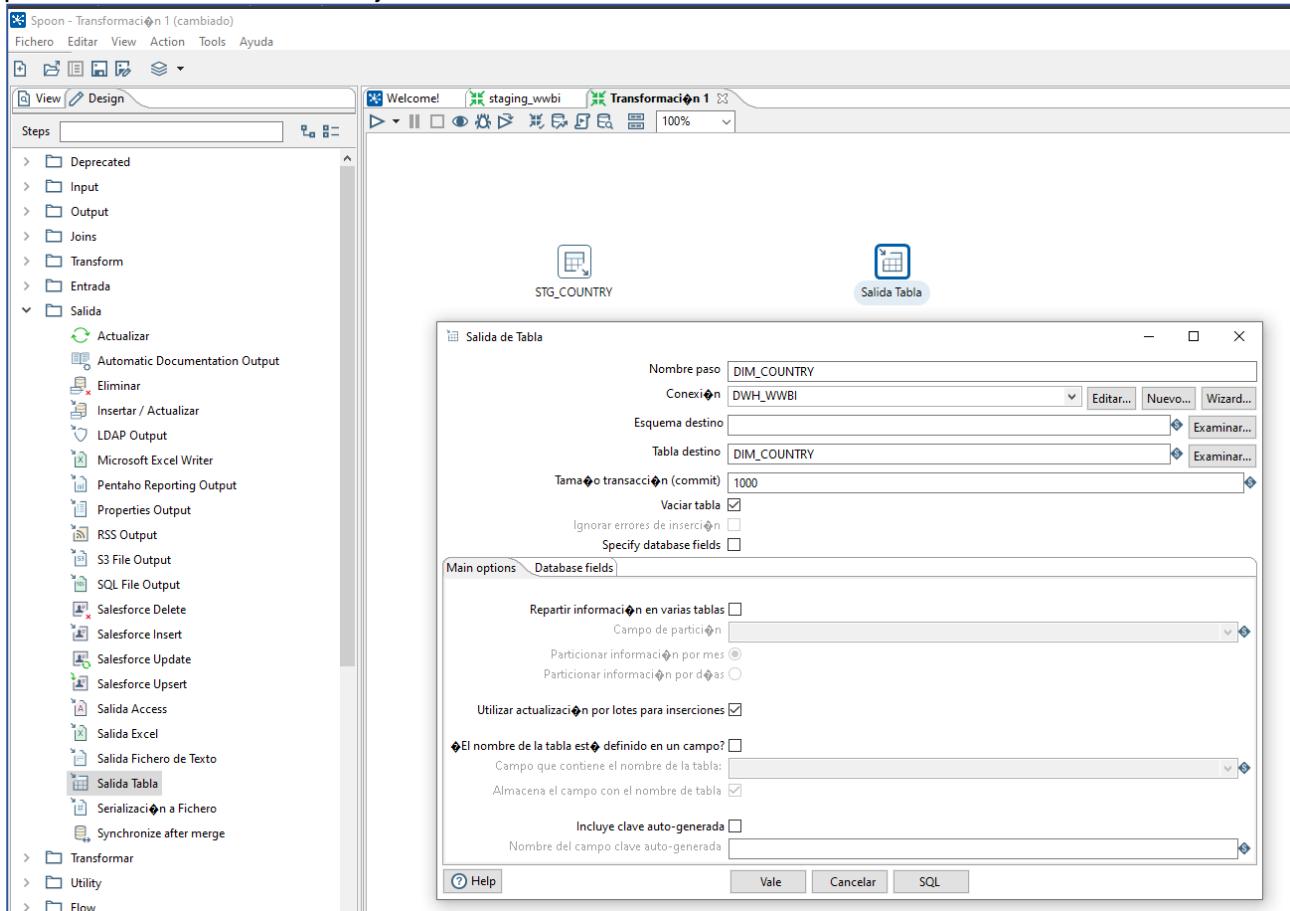
### Visualización previa de los datos que contiene

The screenshot shows the 'Examine preview data' step for the 'STG\_COUNTRY' step. It displays 115 rows of data with columns: #, Country Code, Short Name, Table Name, Long Name, 2-alpha code, Currency Unit, and Special Notes. The 'Special Notes' column contains detailed fiscal and reporting period information for each country. The table is scrollable, and a 'Cerrar' (Close) button is visible at the bottom right.

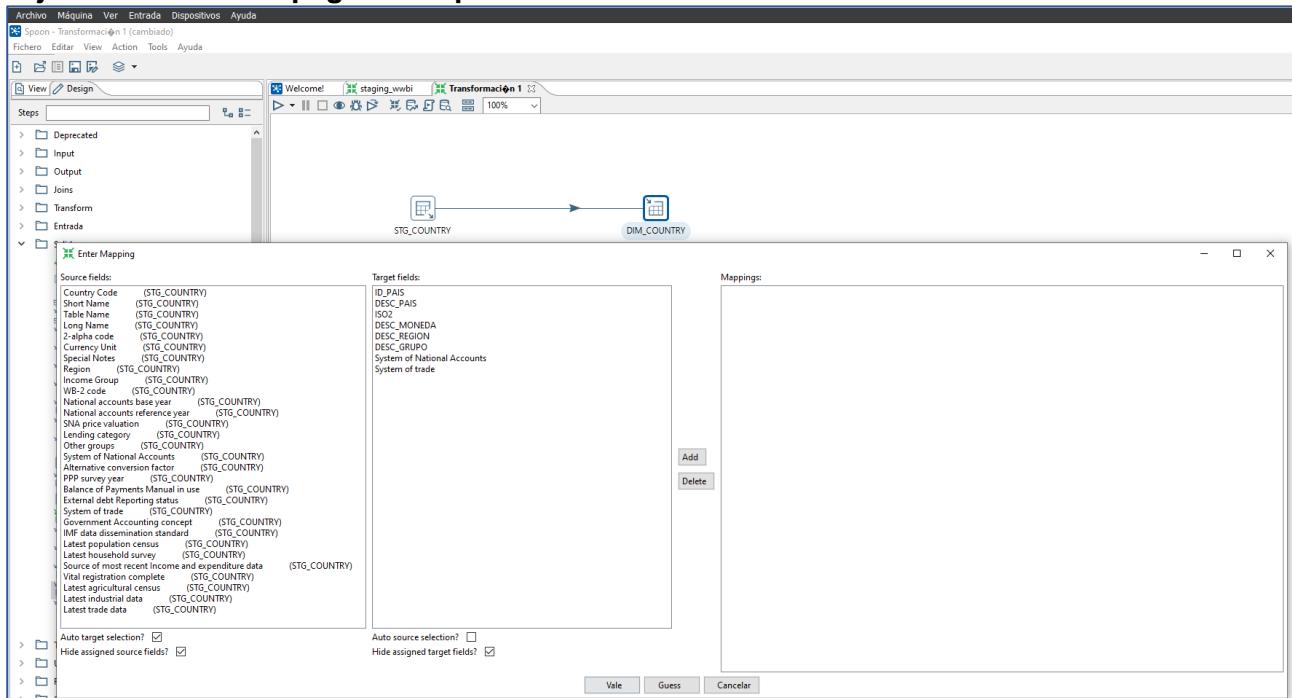
#	Country Code	Short Name	Table Name	Long Name	2-alpha code	Currency Unit	Special Notes
1	AFG	Afghanistan	Afghanistan	Islamic State of Afghanistan	AF	Afghan afghani	Fiscal year end: March 20; reporting period for national accounts data is calendar year, estimated to insure consistency between national acc
2	AGO	Angola	Angola	People's Republic of Angola	AO	Angolan kwanza	<null>
3	ALB	Albania	Albania	Republic of Albania	AL	Albanian lek	<null>
4	ARG	Argentina	Argentina	Argentine Republic	AR	Argentine peso	National Institute of Statistics and Census revised national accounts from 2004-2015. Argentina, which was temporarily unclassified in July 2015.
5	BEN	Benin	Benin	Republic of Benin	BJ	West African CFA franc	<null>
6	BFA	Burkina Faso	Burkina Faso	People's Republic of Bangladesh	BF	West African CFA franc	<null>
7	BGD	Bangladesh	Bangladesh	People's Republic of Bangladesh	BD	Bangladeshi taka	Fiscal year end: June 30; reporting period for national accounts data: FY.
8	BGR	Bulgaria	Bulgaria	Republic of Bulgaria	BG	Bulgarian lev	<null>
9	BHR	Bosnia and Herzegovina	Bosnia and Herzegovina	People's Republic of Bosnia and Herzegovina	BA	Bosnian and Herzegovina convertible mark	<null>
10	BOL	Bolivia	Bolivia	Plurinational State of Bolivia	BO	Bolivian Boliviano	<null>
11	BRA	Brazil	Brazil	Federative Republic of Brazil	BR	Brazilian real	<null>
12	PRI	Puerto Rico	Puerto Rico	Puerto Rico	PR	U.S. dollar	Fiscal year end: June 30; reporting period for national accounts data: FY.
13	BTN	Bhutan	Bhutan	Kingdom of Bhutan	BT	Bhutanese ngultrum	<null>
14	BWA	Botswana	Botswana	Republic of Botswana	BW	Botswana pula	Fiscal year end: March 31; reporting period for national accounts data: CY. Based on official government statistics, national accounts data ha
15	CAF	Central African Republic	Central African Republic	Central African Republic	CF	Central African CFA franc	The source of national accounts has changed to the International Monetary Fund. The base year has reverted back to 1985; the new referenc
16	CAN	Canada	Canada	Canada	CA	Canadian dollar	Fiscal year end: March 31; reporting period for national accounts data: CY.
17	CHL	Chile	Chile	Republic of Chile	CL	Chilean peso	Country uses chain linked methodology.
18	CHN	China	China	People's Republic of China	CN	Chinese yuan	On 1 July 1997 China resumed its exercise of sovereignty over Hong Kong; and on 20 December 1999 China resumed its exercise of sovereign
19	CHE	Cameroun	Cameroun	Republic of Cameroun	CM	Central African CFA franc	National accounts data revised from 1993-2016.
20	COD	Congo, Dem. Rep.	Congo, Dem. Rep.	Democratic Republic of the Congo	CD	Congolese franc	WB-2 code changed from ZAR to COD to align with ISO code.
21	COG	Congo	Congo, Rep.	Republic of Congo	CG	Central African CFA franc	<null>
22	COL	Colombia	Colombia	Republic of Colombia	CO	Colombian peso	<null>
23	COM	Comoros	Comoros	Union of the Comoros	KM	Comorian franc	<null>
24	CPL	Cabo Verde	Cabo Verde	Republic of Cabo Verde	CV	Cabo Verde escudo	Cabo Verde is the name for the country previously listed as Cape Verde. Value added is measured in basic prices.
25	CRI	Costa Rica	Costa Rica	Republic of Costa Rica	CR	Costa Rican colon	National accounts are revised from 1991 to 2015 using SNA 2008 based on official government data. The new reference year is 2012. The cou
26	DEU	Germany	Germany	Federal Republic of Germany	DE	Euro	A simple multiplier is used to convert the national currencies of EMU members to euros. The following irrevocable euro conversion rate was
27	DJI	Djibouti	Djibouti	Republic of Djibouti	DJ	Djibouti franc	<null>
28	DOM	Dominican Republic	Dominican Republic	Dominican Republic	DO	Dominican peso	The Dominican Republic uses chain linked methodology.
29	ECU	Ecuador	Ecuador	Republic of Ecuador	EC	U.S. dollar	<null>
30	EGY	Egypt	Egypt, Arab Rep.	Arab Republic of Egypt	EG	Egyptian pound	Fiscal year end: June 30; reporting period for national accounts data: FY.
31	EST	Estonia	Estonia	Republic of Estonia	EE	Euro	A simple multiplier is used to convert the national currencies of EMU members to euros. The following irrevocable euro conversion rate ente
32	ETH	Ethiopia	Ethiopia	Federal Democratic Republic of Ethiopia	ET	Ethiopian birr	Fiscal year end: July 7; reporting period for national accounts data: FY.

## Ejecución de la tabla de salida DIM\_Country

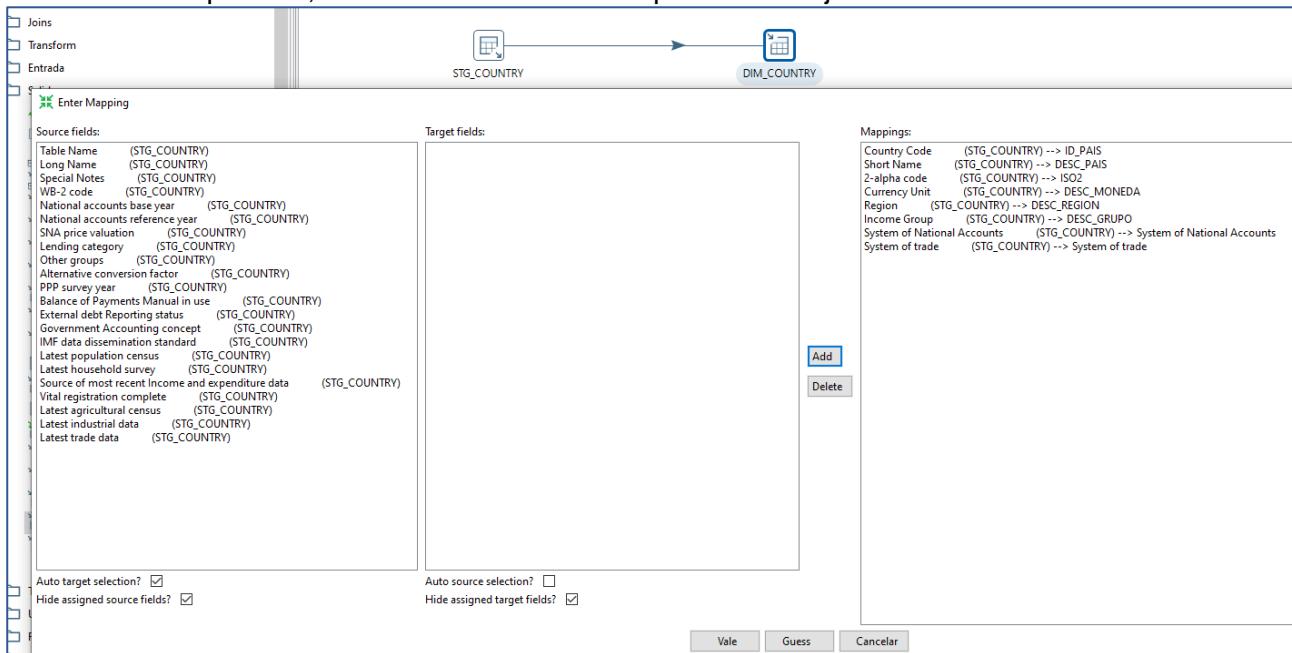
Muy importante mantener activa la opción de "Vaciar Tabla" de lo contrario al cargar nuevamente el proceso nos daría un mensaje de error al contener datos la tabla.

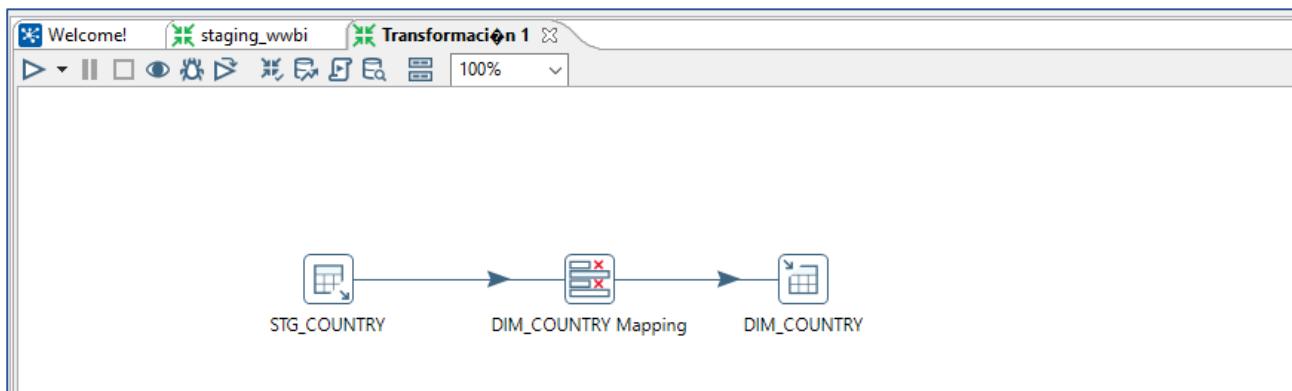


## 38jecución38ión del pago de mapeo

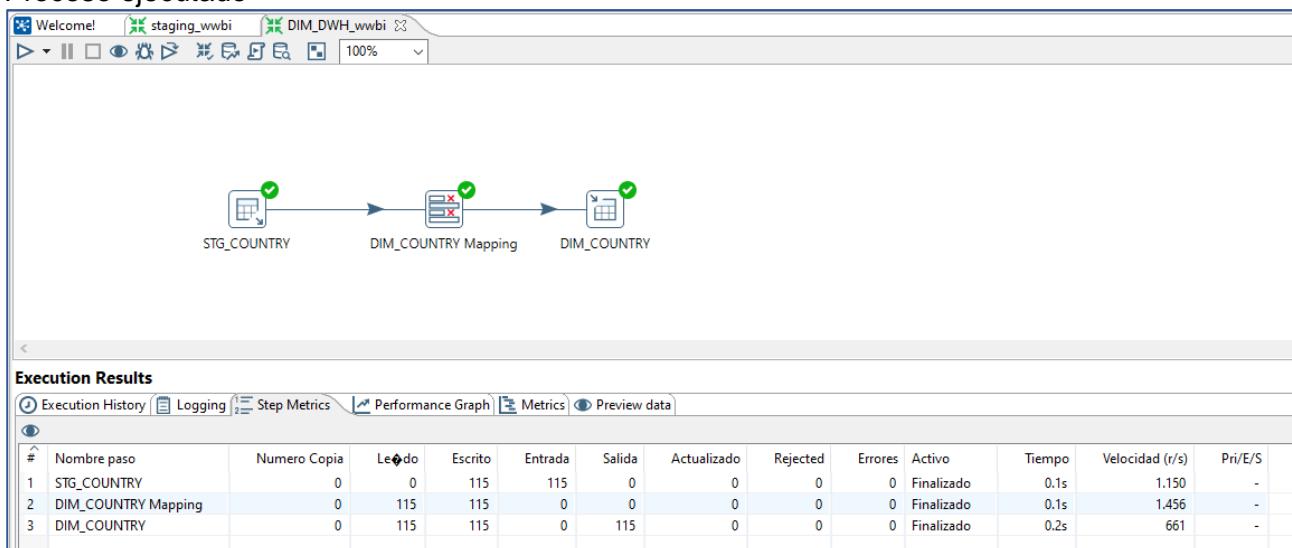


En este caso la selección del mapeo se debe realizar de forma manual en vista que el sistema no identificó las opciones, una vez seleccionado se procede a 38jecución “vale”





## Proceso ejecutado



## Verificación de la ejecución del proceso

Se verifica que los datos se carguen en la base de datos creada como DWH Country

The screenshot shows the SSMS interface with the following details:

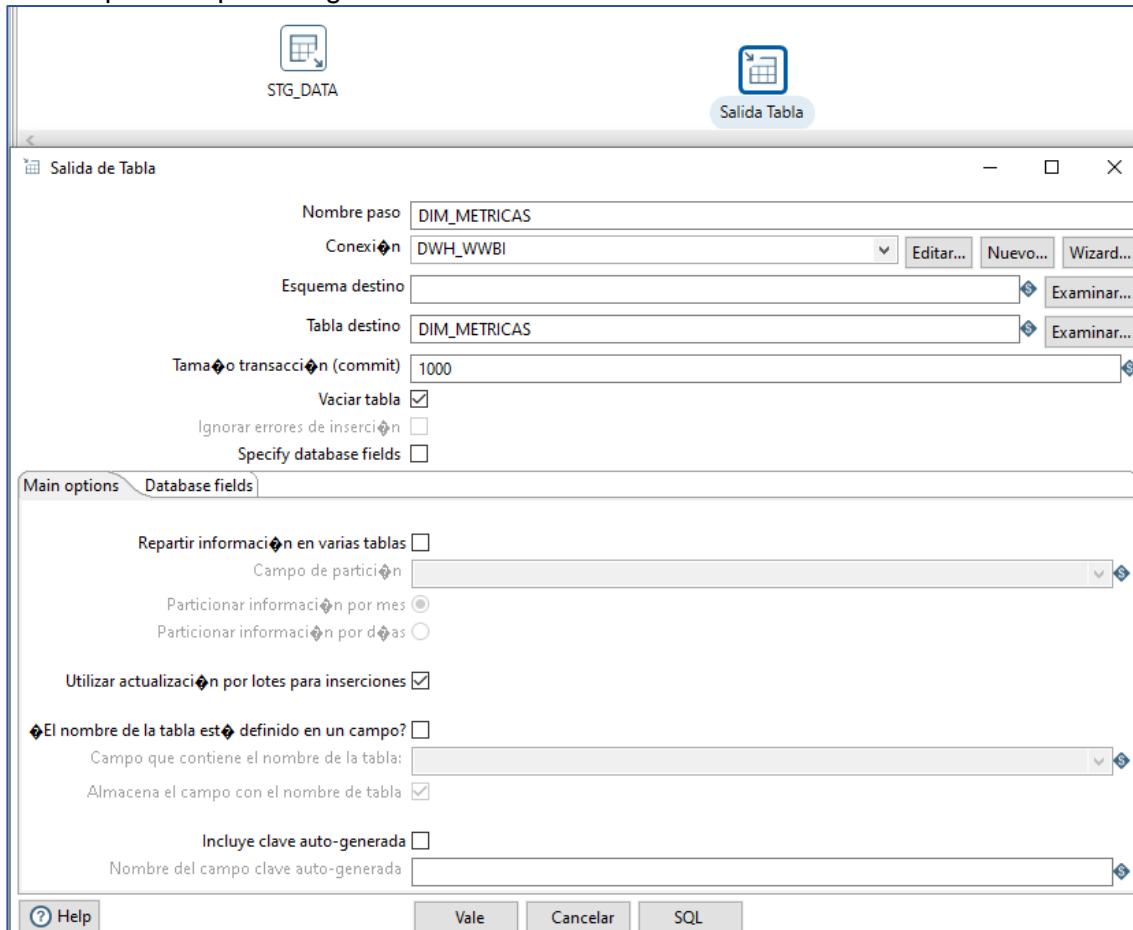
- Object Explorer:** Shows the database structure including 'DESKTOP-4ESN00D\SQLEXPRESS (SQL Server 15.0.2000)' with its databases (System Databases, DWH\_WWBI), tables (System Tables, FileTables, External Tables, Graph Tables), views, external resources, synonyms, programmability, service broker, storage, security, and more.
- SQL Query Editor:** Contains a script for selecting top 1000 rows from the 'ID\_PAIS' table. The script includes columns: ID\_PAIS, DESC\_PAIS, ISO2, DESC\_MONEDA, DESC\_REGION, DESC\_GRUPO, System of National Accounts, and System of trade. The script is as follows:

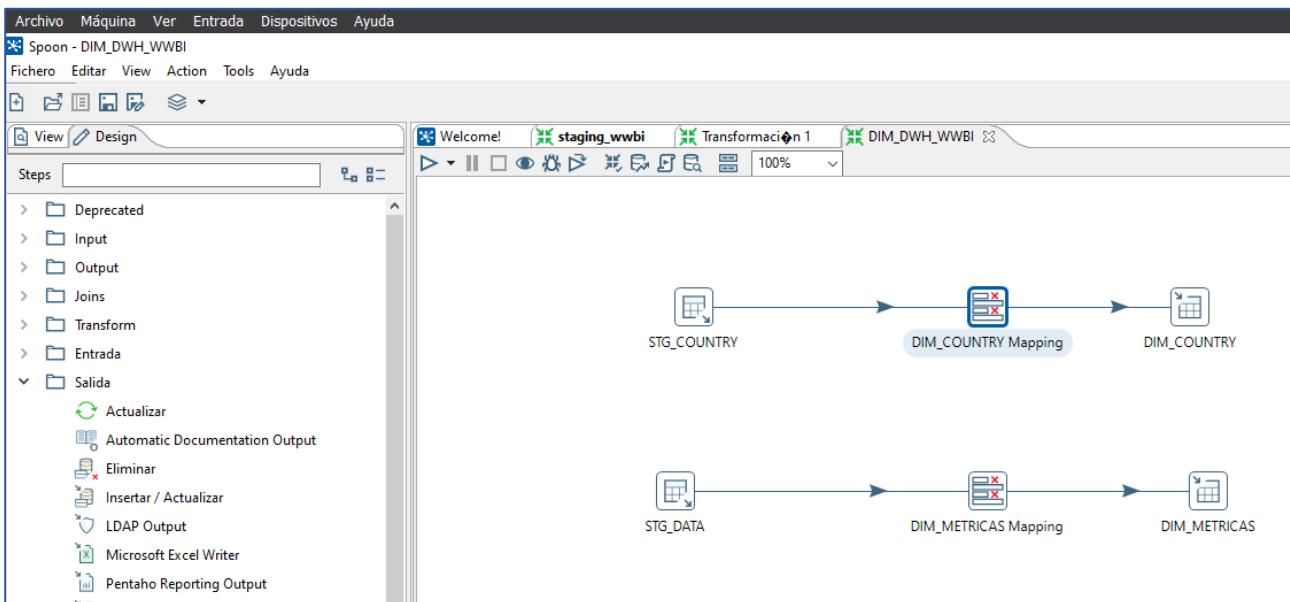
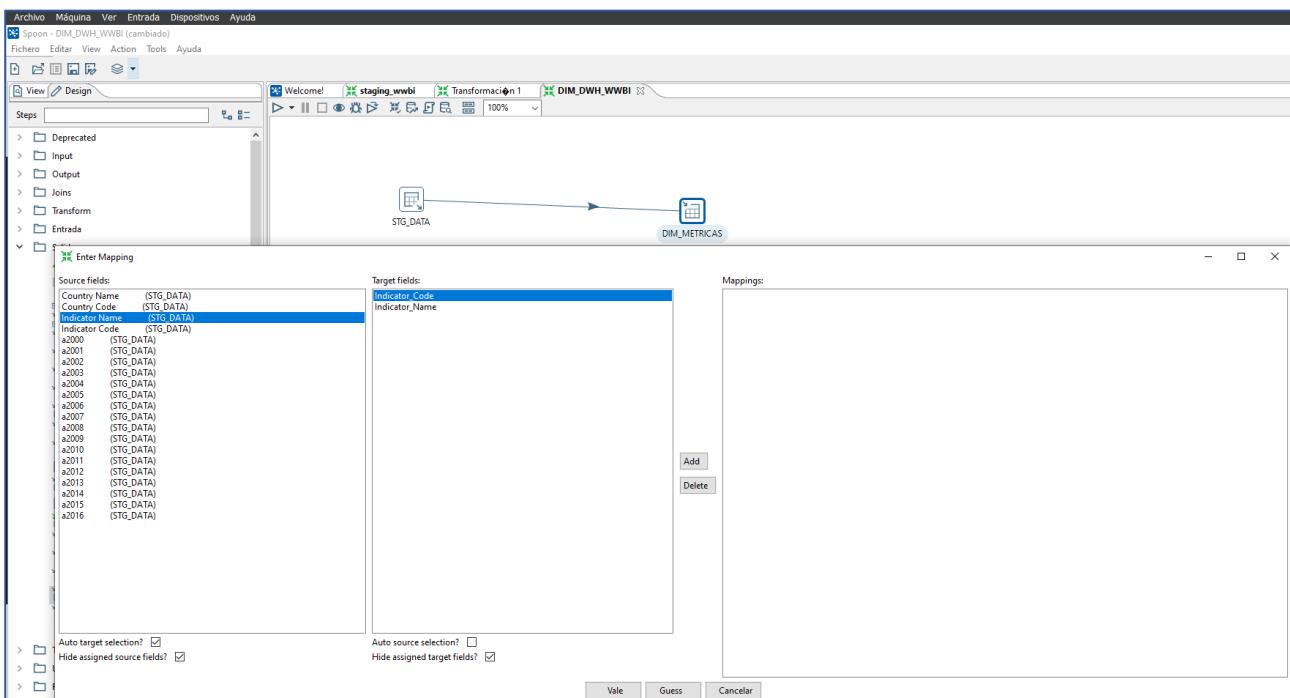
```

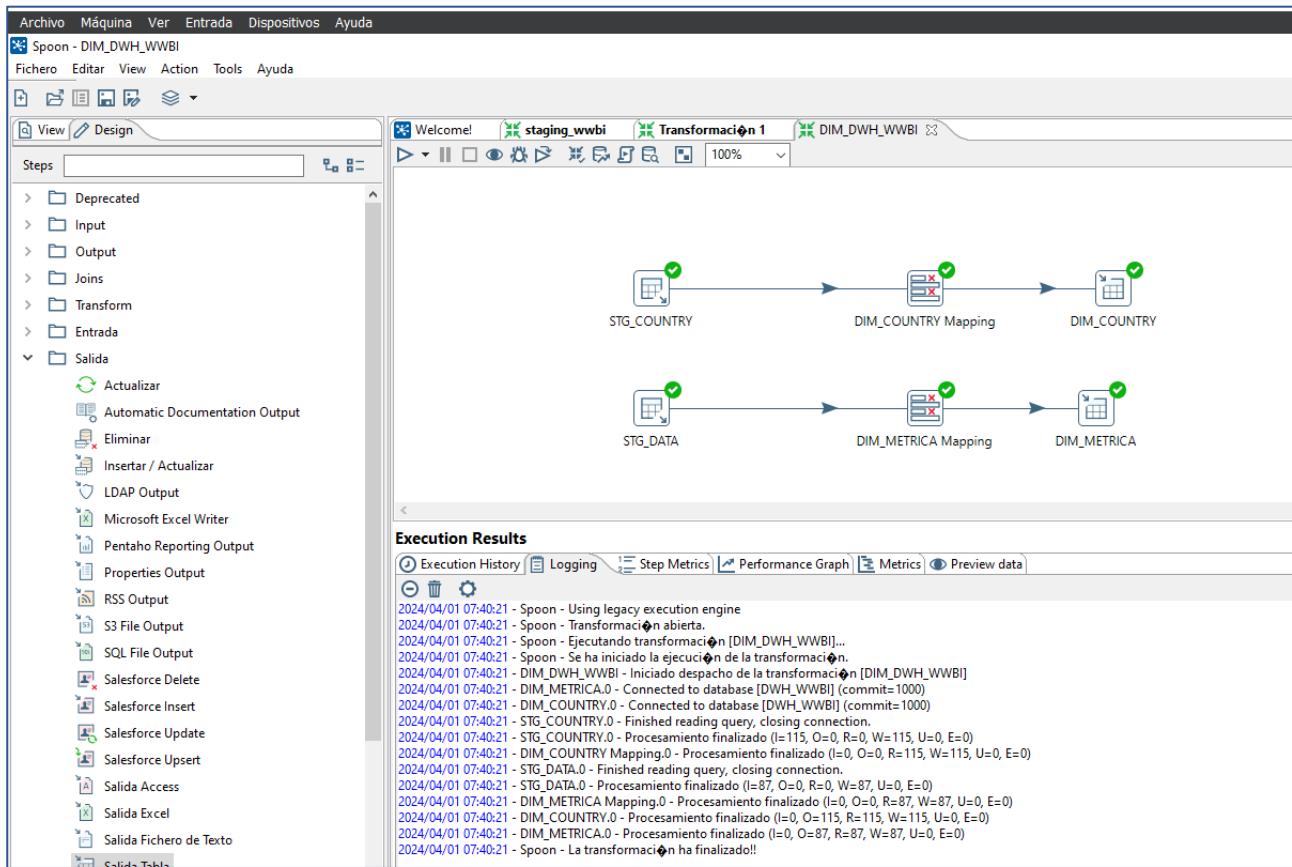
SELECT TOP (1000) [ID_PAIS]
      ,[ISO2]
      ,[DESC_MONEDA]
      ,[DESC_REGION]
      ,[DESC_GRUPO]
      ,[System of National Accounts]
      ,[System of trade]
  FROM [DWH_WWBI].[dbo].[DIM_COUNTRY]
  
```

- Results Grid:** Displays the results of the query, showing 18 rows of country data. The columns are: ID\_PAIS, DESC\_PAIS, ISO2, DESC\_MONEDA, DESC\_REGION, DESC\_GRUPO, System of National Accounts, and System of trade. The data includes entries like AFG (Afghanistan), AGO (Angola), ALB (Albania), ARG (Argentina), BEN (Benin), BFA (Burkina Faso), BGD (Bangladesh), BGR (Bulgaria), BIH (Bosnia and Herzegovina), BOL (Bolivia), BRA (Brazil), BTN (Bhutan), BWA (Botswana), CAF (Central African Republic), CAN (Canada), CHL (Chile), CHN (China), and CMR (Cameroon).

Creacion del proceso para carga de los datos en la tabla de Dat WareHouse







## Verificación de la ejecución del proceso

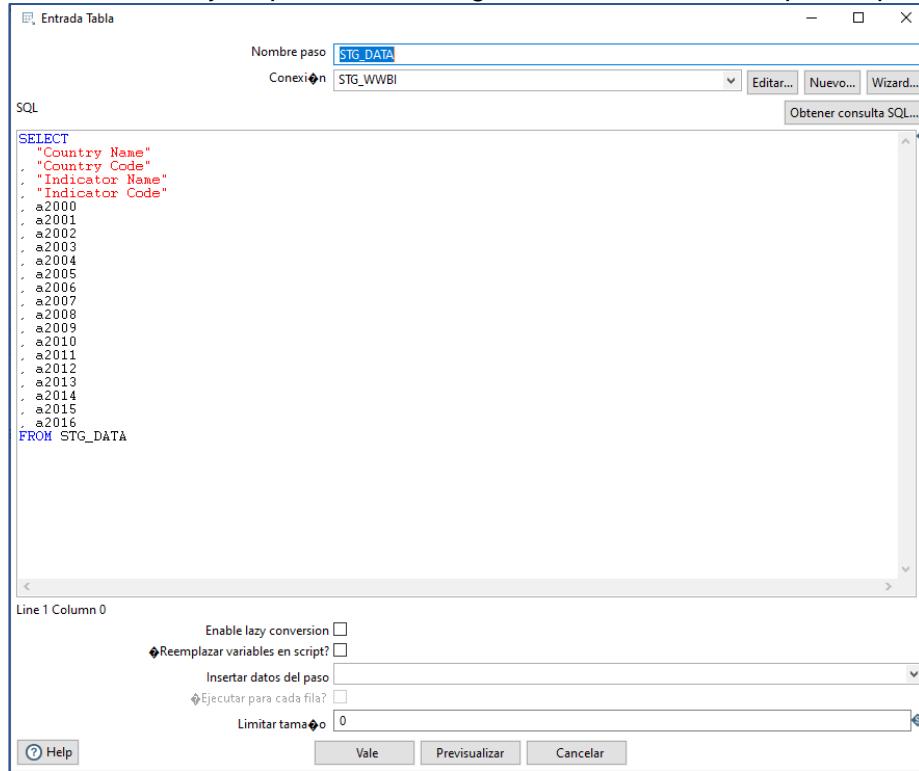
Se verifica que los datos se carguen en la base de datos creada como DWH Metricas

```
SQLQuery8.sql - DE...-4ESN00D\IMF (56) - X SQLQuery7.sql - DE...-4ESN00D\IMF (60) SQLQuery
===== Script for SelectTopNRows command from SSMS =====
SELECT TOP (1000) [Indicator_Code]
,[Indicator_Name]
FROM [DWH_WWBI].[dbo].[DIM_METRICAS]
```

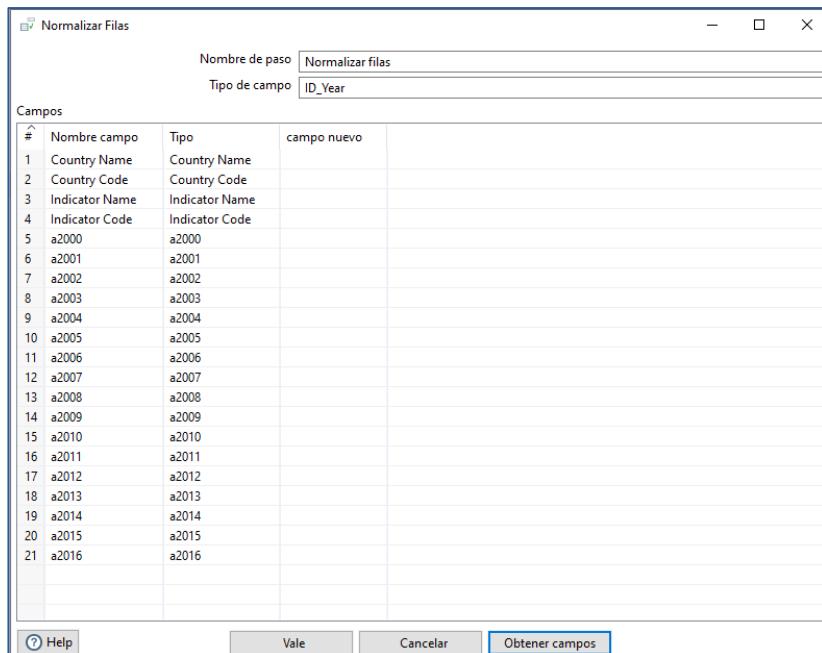
Indicator_Code	Indicator_Name
1 BI.EMP.FRML.PB.ZS	Public sector employment as a share of formal empl...
2 BI.EMP.PWRK.PB.FE.ZS	Public sector employment as a share of paid empl...
3 BI.EMP.PWRK.PB.MA.ZS	Public sector employment as a share of paid empl...
4 BI.EMP.PWRK.PB.RU.ZS	Public sector employment as a share of paid empl...
5 BI.EMP.PWRK.PB.UR.ZS	Public sector employment as a share of paid empl...
6 BI.EMP.PWRK.PB.ZS	Public sector employment as a share of paid empl...
7 BI.EMP.TOTL.NO	Number of employed individuals
8 BI.EMP.TOTL.PB.FE.ZS	Public sector employment as a share of total empl...
9 BI.EMP.TOTL.PB.MA.ZS	Public sector employment as a share of total empl...
10 BI.EMP.TOTL.PB.RU.ZS	Public sector employment as a share of total empl...
11 BI.EMP.TOTL.PB.TT.ZS	Proportion of total employees with tertiary educati...
12 BI.EMP.TOTL.PB.UR.ZS	Public sector employment as a share of total empl...
13 BI.EMP.TOTL.PB.ZS	Public sector employment as a share of total empl...
14 BI.POP.TOTL.CV	Sample size
15 BI.PWK.AGES.PB.MD	Median age of public paid employees
16 BI.PWK.AGES.PB.SM	Mean age of public paid employees
17 BI.PWK.AGES.PV.MD	Median age of private paid employees
18 BI.PWK.AGES.PV.SM	Mean age of private paid employees
19 BI.PWK.PRVS.CK.FE.ZS	Females as a share of private paid employees by ...
20 BI.PWK.PRVS.CT.ZS	Share of private paid employees with a contract
21 BI.PWK.PRVS.EO.FE.ZS	Females as a share of private paid employees by ...
22 BI.PWK.PRVS.FE.Q1.ZS	Females, as a share of private paid employee by ...
23 BI.PWK.PRVS.FE.Q2.ZS	Females, as a share of private paid employee by ...
24 BI.PWK.PRVS.FE.Q3.ZS	Females as a share of private paid employee by w...
25 BI.PWK.PRVS.FE.Q4.ZS	Females, as a share of private paid employee by ...

## Creacion del proceso para la tabla hechos

Se elije una entrada de tabla y se procede a configurar los diferentes campos requeridos



## Proceso de Normalizar la tabla



**Normalizar Filas**

#	Nombre campo	Tipo	campo nuevo
1	Country Name	Country Name	
2	Country Code	Country Code	
3	Indicator Name		
4	Indicator Code		
5	a2000		
6	a2001		
7	a2002		
8	a2003		
9	a2004		
10	a2005		
11	a2006		
12	a2007		
13	a2008		
14	a2009		
15	a2010		
16	a2011		
17	a2012		
18	a2013		
19	a2014		
20	a2015		
21	a2016		

Nombre de paso: Normalizar Filas  
Tipo de campo: ID\_Year

Campos

Indicator Name

Indicator Code

a2000

a2001

a2002

a2003

a2004

a2005

a2006

a2007

a2008

a2009

a2010

a2011

a2012

a2013

a2014

a2015

a2016

Subir CTRL-UP  
Bajar CTRL-DOWN  
Ancho de columna óptimo incl. cabecera F3  
Ancho de columna óptimo excl. cabecera F4  
Borrar todo  
Seleccionar todas las filas CTRL-A  
Quitar selección ESC  
Seleccionar con filtro CTRL-F  
Copiar filas seleccionadas al portapapeles CTRL-C  
Pegar contenido del portapapeles a la tabla CTRL-V  
Cortar filas seleccionadas CTRL-X  
Borrar filas seleccionadas DEL  
Conservar sólo las filas seleccionadas CTRL-K  
Copiar el valor del campo a todas las filas  
Deshacer: no disponible CTRL-Z  
Rehacer: no disponible CTRL-Y

Normalización de Fila

STG\_DATA

Normalizar Filas

#	Nombre campo	Tipo	campo nuevo
1	a2000	2000	
2	a2001	2001	
3	a2002	2002	
4	a2003	2003	
5	a2004	2004	
6	a2005	2005	
7	a2006	2006	
8	a2007	2007	
9	a2008	2008	
10	a2009	2009	
11	a2010	2010	
12	a2011	2011	
13	a2012	2012	
14	a2013	2013	
15	a2014	2014	
16	a2015	2015	
17	a2016	2016	

Nombre de paso: Normalizar Filas  
Tipo de campo: ID\_AÑO

Campos

a2000

a2001

a2002

a2003

a2004

a2005

a2006

a2007

a2008

a2009

a2010

a2011

a2012

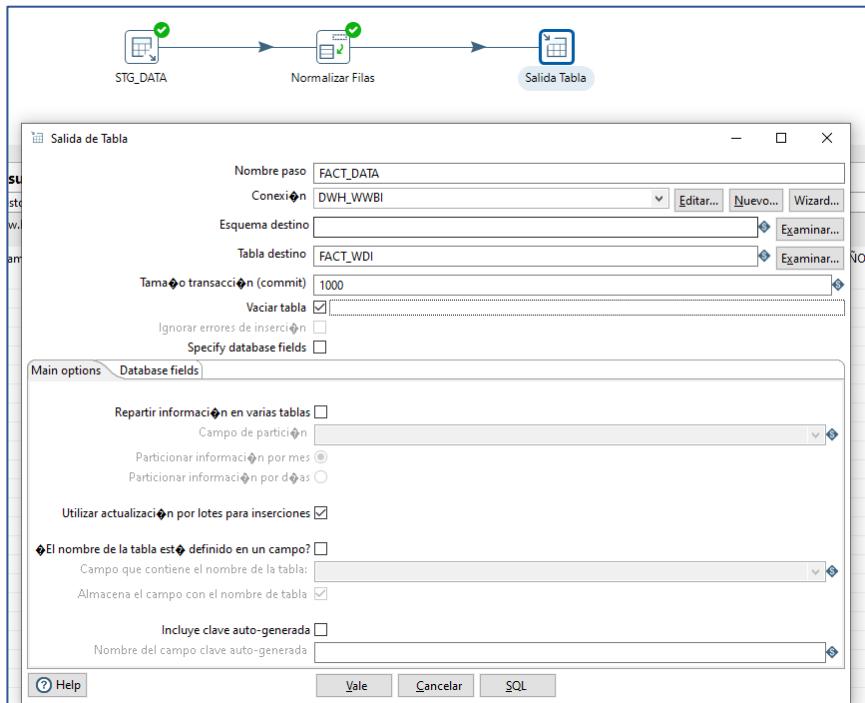
a2013

a2014

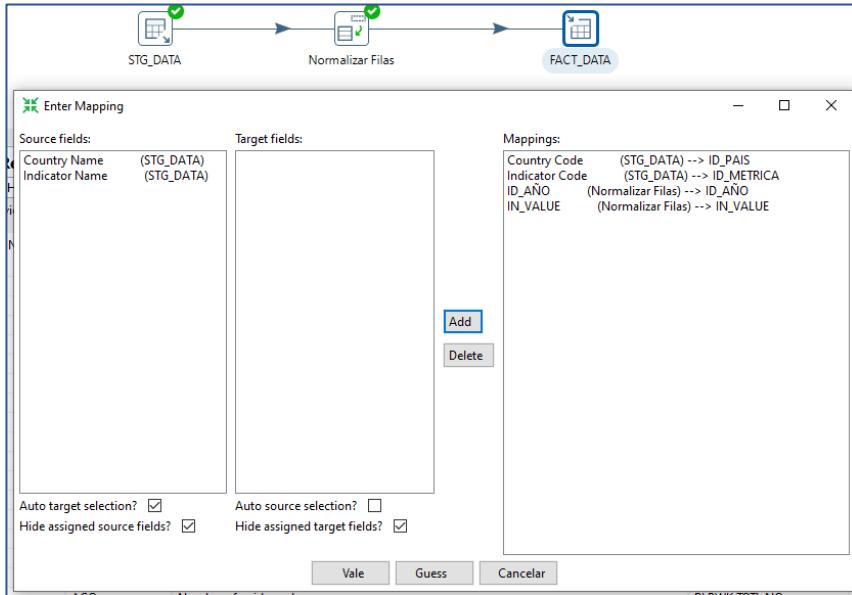
a2015

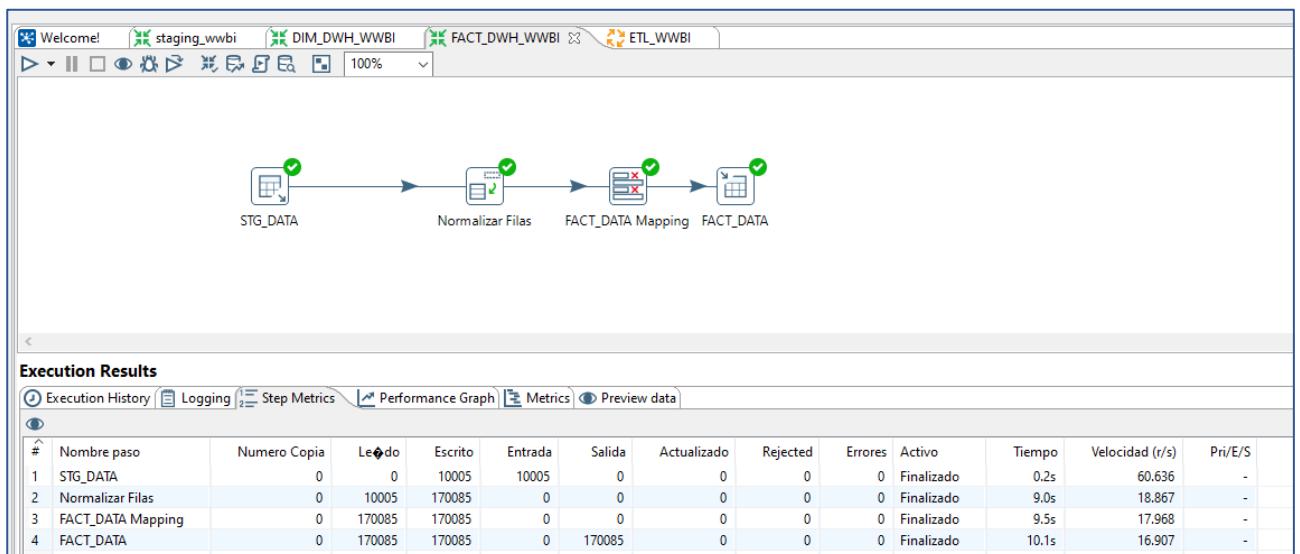
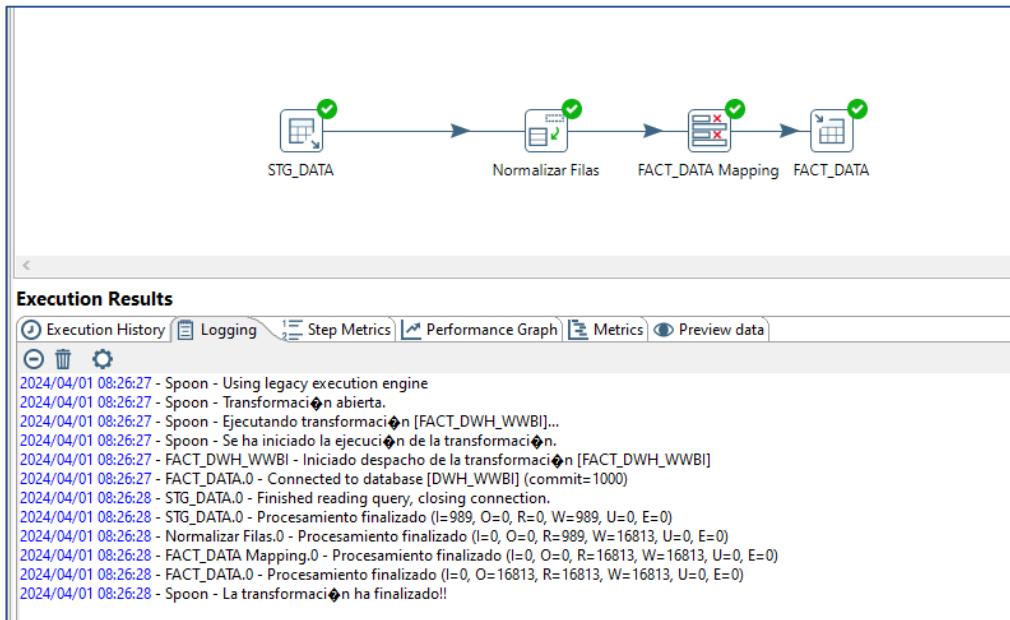
a2016

Help Vale Cancelar Obtener campos



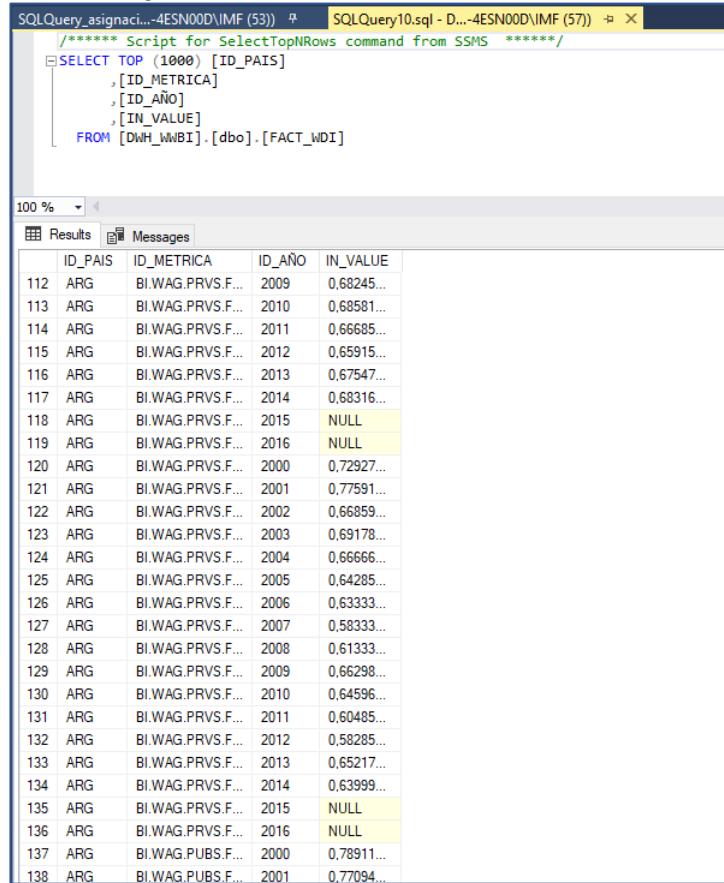
### Mapeo de los datos de la tabla de fact. Tabla de hechos de la base datos warehouse





## Verificación de la ejecución del proceso en SQL

Se verifica que los datos se carguen en la base de datos creada como DWH Fact tabla de hechos.



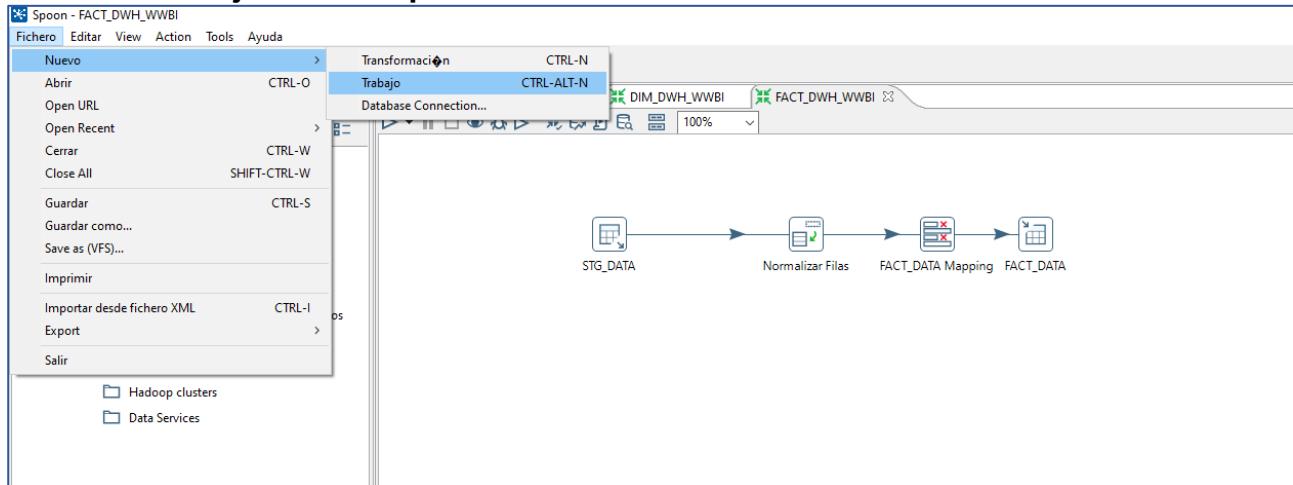
The screenshot shows a SQL Server Management Studio (SSMS) window with a query results grid. The query is:

```
SELECT TOP (1000) [ID_PAIS]
      ,[ID_METRICA]
      ,[ID_AÑO]
      ,[IN_VALUE]
  FROM [DwH_IWBI].[dbo].[FACT_WDI]
```

The results grid displays data for Argentina (ID\_PAIS = 112) from 2009 to 2016, followed by data for Brazil (ID\_PAIS = 113) from 2009 to 2016, and finally data for Chile (ID\_PAIS = 114) from 2011 to 2012. The columns are ID\_PAIS, ID\_METRICA, ID\_AÑO, and IN\_VALUE.

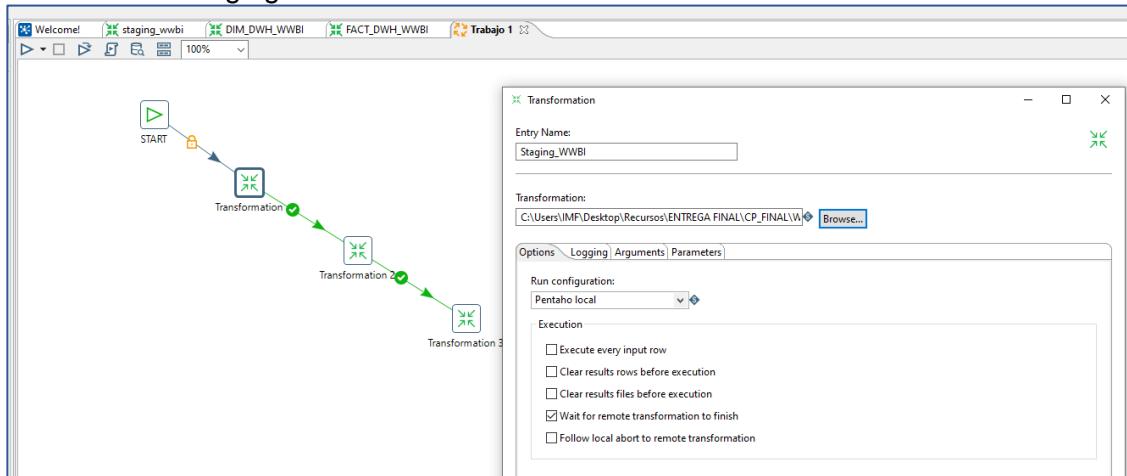
ID_PAIS	ID_METRICA	ID_AÑO	IN_VALUE
112	BI.WAG.PRVS.F...	2009	0.68245...
113	BI.WAG.PRVS.F...	2010	0.68581...
114	BI.WAG.PRVS.F...	2011	0.66685...
115	BI.WAG.PRVS.F...	2012	0.65915...
116	BI.WAG.PRVS.F...	2013	0.67547...
117	BI.WAG.PRVS.F...	2014	0.68316...
118	BI.WAG.PRVS.F...	2015	NULL
119	BI.WAG.PRVS.F...	2016	NULL
120	BI.WAG.PRVS.F...	2000	0.72927...
121	BI.WAG.PRVS.F...	2001	0.77591...
122	BI.WAG.PRVS.F...	2002	0.66859...
123	BI.WAG.PRVS.F...	2003	0.69178...
124	BI.WAG.PRVS.F...	2004	0.66666...
125	BI.WAG.PRVS.F...	2005	0.64285...
126	BI.WAG.PRVS.F...	2006	0.63333...
127	BI.WAG.PRVS.F...	2007	0.58333...
128	BI.WAG.PRVS.F...	2008	0.61333...
129	BI.WAG.PRVS.F...	2009	0.66298...
130	BI.WAG.PRVS.F...	2010	0.64596...
131	BI.WAG.PRVS.F...	2011	0.60485...
132	BI.WAG.PRVS.F...	2012	0.58285...
133	BI.WAG.PRVS.F...	2013	0.65217...
134	BI.WAG.PRVS.F...	2014	0.63999...
135	BI.WAG.PRVS.F...	2015	NULL
136	BI.WAG.PRVS.F...	2016	NULL
137	BI.WAG.PUBS.F...	2000	0.78911...
138	BI.WAG.PUBS.F...	2001	0.77094...

## Crear un Trabajo – Job de proceso

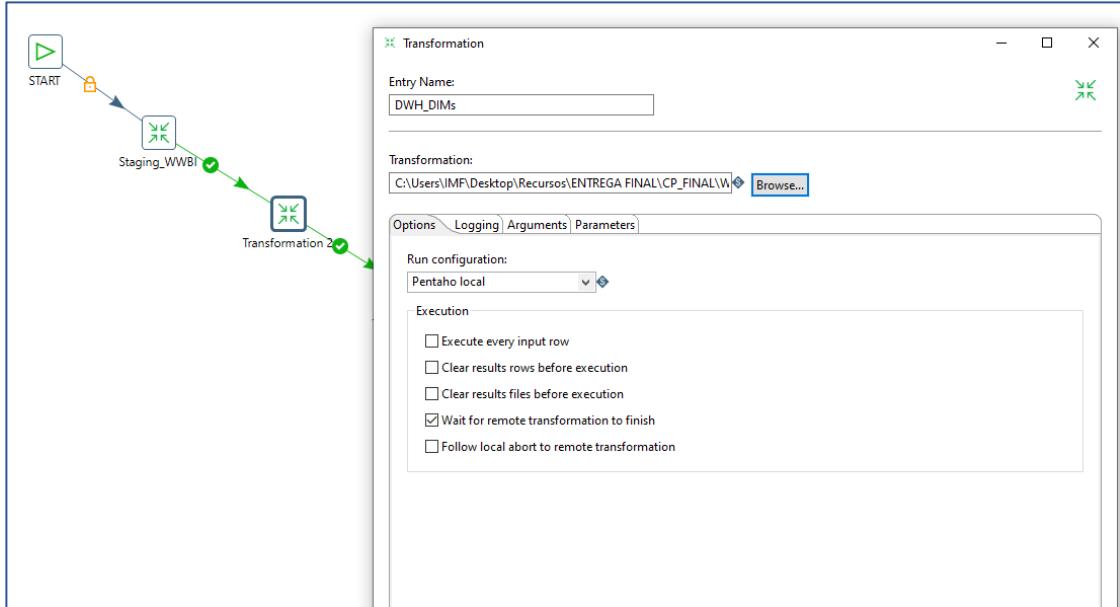


## Configuracion de Job – Flujo de Proceso

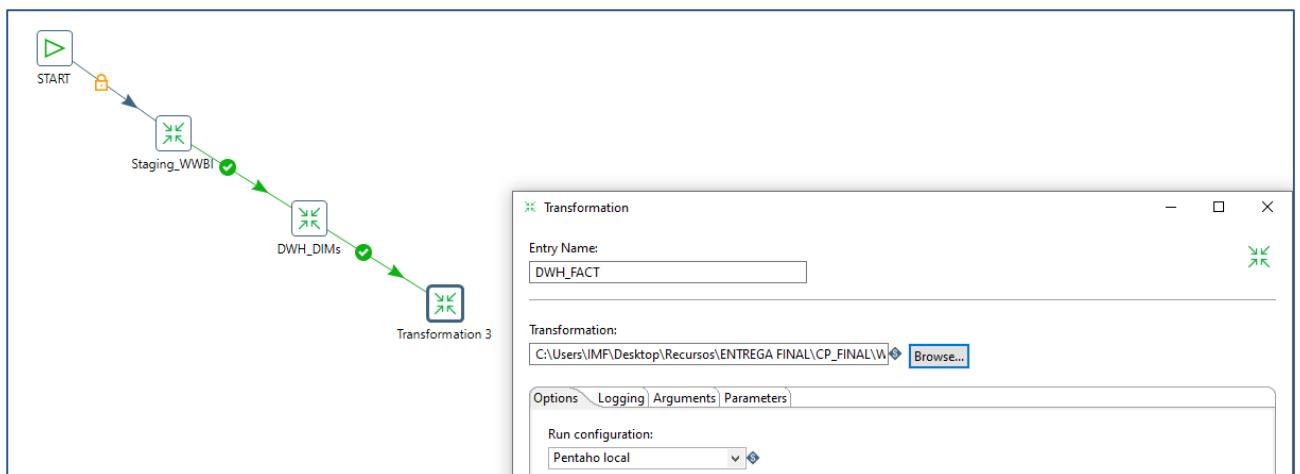
### Transformacion 1 - Staging



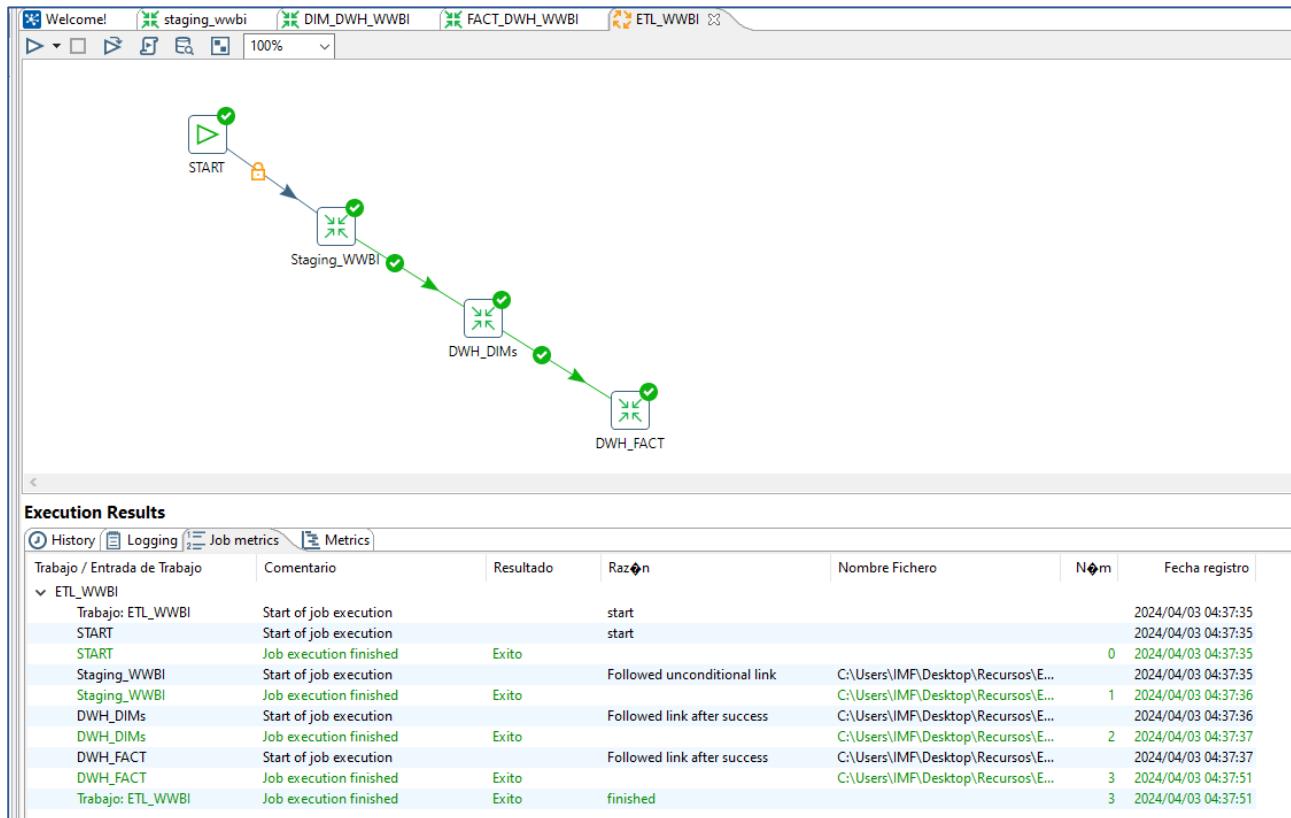
## Transformacion 2 – DWH- DIMS

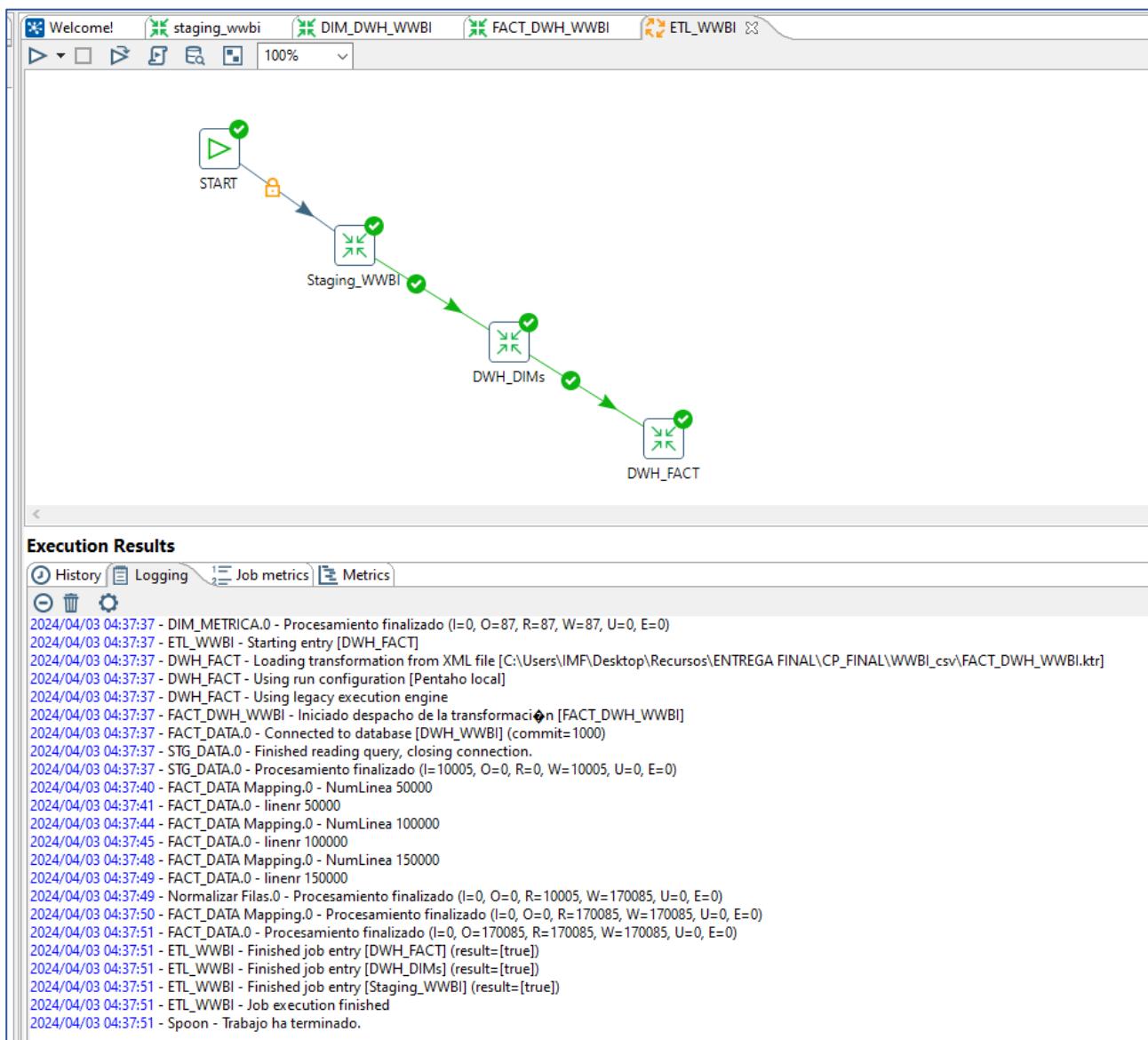


## Transformacion 3 – Tabla de hechos - FACT



## Proceso de Ejecución del Job





Imágenes de código generadas con la página <https://ray.so/>, se utilizó el código de creación suministrado en ejemplo desarrollado durante el curso.

```
  •••••
  **** Desarrollo de ejercicios de SQL para el curso de Data Analytics. Universidad IMF.
Master en Data Science ****/
***** MODULO V INTELIGENCIA DE NEGOCIOS Y VISUALIZACION DE DATOS*****
***** Estudiante Richard Douglas Grijalba. Modalidad Virtual ****/
***** Este comando permite : la Creacion de las tablas Staging*****
USE STG_WBWI

--DROP TABLE STG_COUNTRY

CREATE TABLE STG_COUNTRY(
[Country Code] VARCHAR(250) NULL,
[Short Name] VARCHAR(250) NULL,
[Table Name] VARCHAR(250) NULL,
[Long Name] VARCHAR(250) NULL,
[2-alpha code] VARCHAR(250) NULL,
[Currency Unit] VARCHAR(250) NULL,
[Special Notes] VARCHAR(2500) NULL,
[Region] VARCHAR(250) NULL,
[Income Group] VARCHAR(250) NULL,
[WB-2 code] VARCHAR(250) NULL,
[National accounts base year] VARCHAR(250) NULL,
[National accounts reference year] VARCHAR(250) NULL,
[SNA price valuation] VARCHAR(250) NULL,
[Lending category] VARCHAR(250) NULL,
[Other groups] VARCHAR(250) NULL,
[System of National Accounts] VARCHAR(250) NULL,
[Alternative conversion factor] VARCHAR(250) NULL,
[PPP survey year] VARCHAR(250) NULL,
[Balance of Payments Manual in use] VARCHAR(250) NULL,
[External debt Reporting status] VARCHAR(250) NULL,
[System of trade] VARCHAR(250) NULL,
[Government Accounting concept] VARCHAR(250) NULL,
[IMF data dissemination standard] VARCHAR(250) NULL,
[Latest population census] VARCHAR(250) NULL,
[Latest household survey] VARCHAR(250) NULL,
[Source of most recent Income and expenditure data] VARCHAR(250) NULL,
[Vital registration complete] VARCHAR(250) NULL,
[Latest agricultural census] VARCHAR(250) NULL,
[Latest industrial data] VARCHAR(250) NULL,
[Latest trade data] VARCHAR(250) NULL)

--DROP TABLE STG_DATA
CREATE TABLE STG_DATA(
[Country Name] VARCHAR(250) NULL,
[Country Code] VARCHAR(250) NULL,
[Indicator Name] VARCHAR(250) NULL,
[Indicator Code] VARCHAR(250) NULL,
a2000 VARCHAR(250) NULL,
a2001 VARCHAR(250) NULL,
a2002 VARCHAR(250) NULL,
a2003 VARCHAR(250) NULL,
a2004 VARCHAR(250) NULL,
a2005 VARCHAR(250) NULL,
a2006 VARCHAR(250) NULL,
a2007 VARCHAR(250) NULL,
a2008 VARCHAR(250) NULL,
a2009 VARCHAR(250) NULL,
a2010 VARCHAR(250) NULL,
a2011 VARCHAR(250) NULL,
a2012 VARCHAR(250) NULL,
a2013 VARCHAR(250) NULL,
a2014 VARCHAR(250) NULL,
a2015 VARCHAR(250) NULL,
a2016 VARCHAR(250) NULL)

GO
```

```

• • •

/***** Este comando permite : la Creacion de las tablas data warehouse*****/

USE DWH_WWBI

/***** Object: Table [dbo].[DIM_COUNTRY]      Script Date: 19/05/2020 22:20:51
*****
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].
[DIM_COUNTRY]') AND type in (N'U'))
DROP TABLE [dbo].[DIM_COUNTRY]
GO

/***** Object: Table [dbo].[DIM_COUNTRY]      Script Date: 19/05/2020 22:20:51
*****
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[DIM_COUNTRY](
    [ID_PAIS] [varchar](3) NOT NULL PRIMARY KEY,
    [DESC_PAIS] [varchar](250) NULL,
    [ISO2] [varchar](250) NULL,
    [DESC_MONEDA] [varchar](250) NULL,
    [DESC_REGION] [varchar](250) NULL,
    [DESC_GRUPO] [varchar](250) NULL,
    [System of National Accounts] [varchar](250) NULL,
    [System of trade] [varchar](250) NULL
) ON [PRIMARY]
GO

/***** Object: Table [dbo].[DIM_METRICAS]      Script Date: 19/05/2020 22:21:10
*****
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].
[DIM_METRICAS]') AND type in (N'U'))
DROP TABLE [dbo].[DIM_METRICAS]
GO

/***** Object: Table [dbo].[DIM_METRICAS]      Script Date: 19/05/2020 22:21:10
*****
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[DIM_METRICAS](
    [Indicator_Code] [varchar](270) NOT NULL PRIMARY KEY,
    [Indicator_Name] [varchar](2700) NULL,
) ON [PRIMARY]
GO

```

```
***** Desarrollo de ejercicios de SQL para el curso de Data Analytics. Universidad IMF. Master en Data Science *****/  
***** MODULO V INTELIGENCIA DE NEGOCIOS Y VISUALIZACION DE DATOS*****/  
***** Estudiante Richard Douglas Grijalba. Modalidad Virtual *****
```

```
***** Este comando permite : la Creacion de las tablas Staging*****/  
USE STG_WWBI
```

```
--DROP TABLE STG_COUNTRY
```

```
CREATE TABLE STG_COUNTRY(  
[Country Code]      VARCHAR(250) NULL,  
[Short Name]        VARCHAR(250) NULL,  
[Table Name]         VARCHAR(250) NULL,  
[Long Name]          VARCHAR(250) NULL,  
[2-alpha code]       VARCHAR(250) NULL,  
[Currency Unit]     VARCHAR(250) NULL,  
[Special Notes]     VARCHAR(2500) NULL,  
[Region]             VARCHAR(250) NULL,  
[Income Group]       VARCHAR(250) NULL,  
[WB-2 code]          VARCHAR(250) NULL,  
[National accounts base year]    VARCHAR(250) NULL,  
[National accounts reference year] VARCHAR(250) NULL,  
[SNA price valuation]    VARCHAR(250) NULL,  
[Lending category]    VARCHAR(250) NULL,  
[Other groups]        VARCHAR(250) NULL,  
[System of National Accounts]   VARCHAR(250) NULL,  
[Alternative conversion factor] VARCHAR(250) NULL,  
[PPP survey year]      VARCHAR(250) NULL,  
[Balance of Payments Manual in use] VARCHAR(250) NULL,  
[External debt Reporting status]  VARCHAR(250) NULL,  
[System of trade]        VARCHAR(250) NULL,  
[Government Accounting concept]  VARCHAR(250) NULL,  
[IMF data dissemination standard] VARCHAR(250) NULL,  
[Latest population census]     VARCHAR(250) NULL,  
[Latest household survey]      VARCHAR(250) NULL,  
[Source of most recent Income and expenditure data]  VARCHAR(250) NULL,  
[Vital registration complete]  VARCHAR(250) NULL,  
[Latest agricultural census]   VARCHAR(250) NULL,  
[Latest industrial data]       VARCHAR(250) NULL,  
[Latest trade data]           VARCHAR(250) NULL)
```

```
--DROP TABLE STG_DATA
```

```
CREATE TABLE STG_DATA(  
[Country Name]      VARCHAR(250) NULL,  
[Country Code]        VARCHAR(250) NULL,  
[Indicator Name]     VARCHAR(250) NULL,  
[Indicator Code]      VARCHAR(250) NULL,  
a2000    VARCHAR(250) NULL,  
a2001    VARCHAR(250) NULL,  
a2002    VARCHAR(250) NULL,  
a2003    VARCHAR(250) NULL,  
a2004    VARCHAR(250) NULL,  
a2005    VARCHAR(250) NULL,  
a2006    VARCHAR(250) NULL,  
a2007    VARCHAR(250) NULL,  
a2008    VARCHAR(250) NULL,  
a2009    VARCHAR(250) NULL,  
a2010    VARCHAR(250) NULL,  
a2011    VARCHAR(250) NULL,  
a2012    VARCHAR(250) NULL,  
a2013    VARCHAR(250) NULL,  
a2014    VARCHAR(250) NULL,
```

```
a2015  VARCHAR(250) NULL,  
a2016  VARCHAR(250) NULL)
```

```
GO
```

```
***** Este comando permite : la Creacion de las tablas data warehouse*****
```

```
USE DWH_WWBI
```

```
***** Object: Table [dbo].[DIM_COUNTRY]  Script Date: 19/05/2020 22:20:51 *****  
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[DIM_COUNTRY]') AND type in (N'U'))  
DROP TABLE [dbo].[DIM_COUNTRY]  
GO
```

```
***** Object: Table [dbo].[DIM_COUNTRY]  Script Date: 19/05/2020 22:20:51 *****  
SET ANSI_NULLS ON  
GO
```

```
SET QUOTED_IDENTIFIER ON  
GO
```

```
CREATE TABLE [dbo].[DIM_COUNTRY](  
    [ID_PAIS] [varchar](3) NOT NULL PRIMARY KEY,  
    [DESC_PAIS] [varchar](250) NULL,  
    [ISO2] [varchar](250) NULL,  
    [DESC_MONEDA] [varchar](250) NULL,  
    [DESC_REGION] [varchar](250) NULL,  
    [DESC_GRUPO] [varchar](250) NULL,  
    [System of National Accounts] [varchar](250) NULL,  
    [System of trade] [varchar](250) NULL  
) ON [PRIMARY]  
GO
```

```
GO
```

```
***** Object: Table [dbo].[DIM_METRICAS]  Script Date: 19/05/2020 22:21:10 *****  
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[DIM_METRICAS]') AND type in (N'U'))  
DROP TABLE [dbo].[DIM_METRICAS]  
GO
```

```
***** Object: Table [dbo].[DIM_METRICAS]  Script Date: 19/05/2020 22:21:10 *****  
SET ANSI_NULLS ON  
GO
```

```
SET QUOTED_IDENTIFIER ON  
GO  
  
CREATE TABLE [dbo].[DIM_METRICAS](  
    [Indicator_Code] [varchar](270) NOT NULL PRIMARY KEY,  
    [Indicator_Name] [varchar](2700) NULL,  
) ON [PRIMARY]  
GO
```

```
***** Object: Table [dbo].[FACT_WDI]  Script Date: 19/05/2020 22:25:12 *****  
IF EXISTS (SELECT * FROM sys.objects WHERE object_id = OBJECT_ID(N'[dbo].[FACT_WDI]') AND type in (N'U'))
```

```
Asignación final Módulo Inteligencia de negocio y visualización  
Richard Douglas Grijalba. Modalidad virtual
```

```

DROP TABLE [dbo].[FACT_WDI]
GO

/**************** Object: Table [dbo].[FACT_WDI]  Script Date: 19/05/2020 22:25:12 *****/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[FACT_WDI](
    [ID_PAIS] [varchar](3) NULL,
    [ID_METRICA] [varchar](270) NULL,
    [ID_AÑO] INT NULL,
    [IN_VALUE] FLOAT NULL
) ON [PRIMARY]
GO

/**************** Este comando permite : conocer la estructura de la base de datos *****/
SELECT
    *
FROM
    information_schema.tables;

    SELECT @@SERVERNAME AS 'Nombre del Servidor';

   /**************** Este comando permite : probar que se cargaron los datos en la tabla country****/
   /**************** Script for SelectTopNRows command from SSMS *****/
SELECT TOP (1000) [Country Code]
    ,[Short Name]
    ,[Table Name]
    ,[Long Name]
    ,[2-alpha code]
    ,[Currency Unit]
    ,[Special Notes]
    ,[Region]
    ,[Income Group]
    ,[WB-2 code]
    ,[National accounts base year]
    ,[National accounts reference year]
    ,[SNA price valuation]
    ,[Lending category]
    ,[Other groups]
    ,[System of National Accounts]
    ,[Alternative conversion factor]
    ,[PPP survey year]
    ,[Balance of Payments Manual in use]
    ,[External debt Reporting status]
    ,[System of trade]
    ,[Government Accounting concept]
    ,[IMF data dissemination standard]
    ,[Latest population census]
    ,[Latest household survey]
    ,[Source of most recent Income and expenditure data]
    ,[Vital registration complete]
    ,[Latest agricultural census]
    ,[Latest industrial data]
    ,[Latest trade data]
FROM [STG_WWBI].[dbo].[STG_COUNTRY]

/**************** Este comando permite : conocer el total de filas de la tabla country *****/

```

/\*\*\*\*\*Este comando permite : conocer el total de filas de la tabla country \*\*\*\*\*/

```

SELECT COUNT(*) AS TotalFilas
FROM STG_COUNTRY;

***** Este comando permite : conocer el total de filas de la tabla data *****

SELECT COUNT(*) AS TotalFilas
FROM STG_DATA;

***** Este comando permite : revisar que los datos de la tabla DIM Country se encuentren cargados *****

***** Script for SelectTopNRows command from SSMS *****
SELECT TOP (1000) [ID_PAIS]
,[DESC_PAIS]
,[ISO2]
,[DESC_MONEDA]
,[DESC_REGION]
,[DESC_GRUPO]
,[System of National Accounts]
,[System of trade]
FROM [DWH_WWBI].[dbo].[DIM_COUNTRY]

***** Este comando permite : Revisar la carga correcta de los datos en la tabla DIM Metricas *****
***** Script for SelectTopNRows command from SSMS *****
SELECT TOP (1000) [Indicator_Code]
,[Indicator_Name]
FROM [DWH_WWBI].[dbo].[DIM_METRICAS]

***** Este comando permite : Verificar la carga de datos en la tabla de FACT *****
***** Script for SelectTopNRows command from SSMS *****
SELECT TOP (1000) [ID_PAIS]
,[ID_METRICA]
,[ID_AÑO]
,[IN_VALUE]
FROM [DWH_WWBI].[dbo].[FACT_WDI]

***** Este comando permite : Contar la cantidad de filas de la tabla de hechos*****
SELECT COUNT(*) AS TotalFilas
FROM FACT_WDI;

***** Este comando permite : Cuantos paises pertenecen a Income Group*****
SELECT DESC_GRUPO, COUNT(*) AS cantidad_paises
FROM DIM_COUNTRY
GROUP BY DESC_GRUPO;

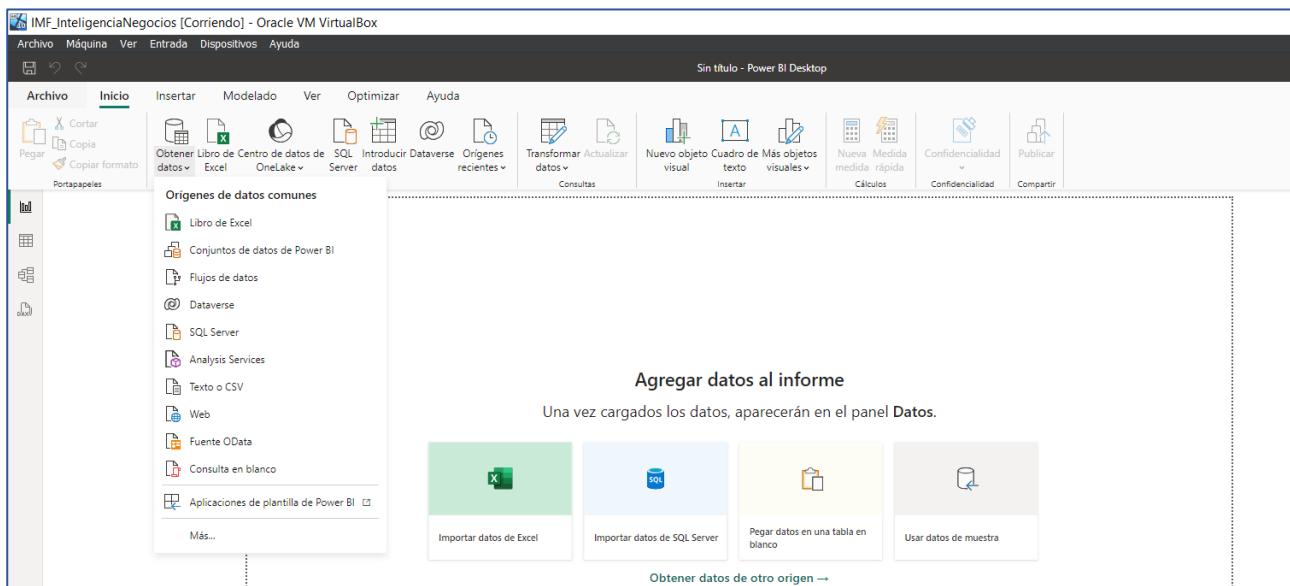
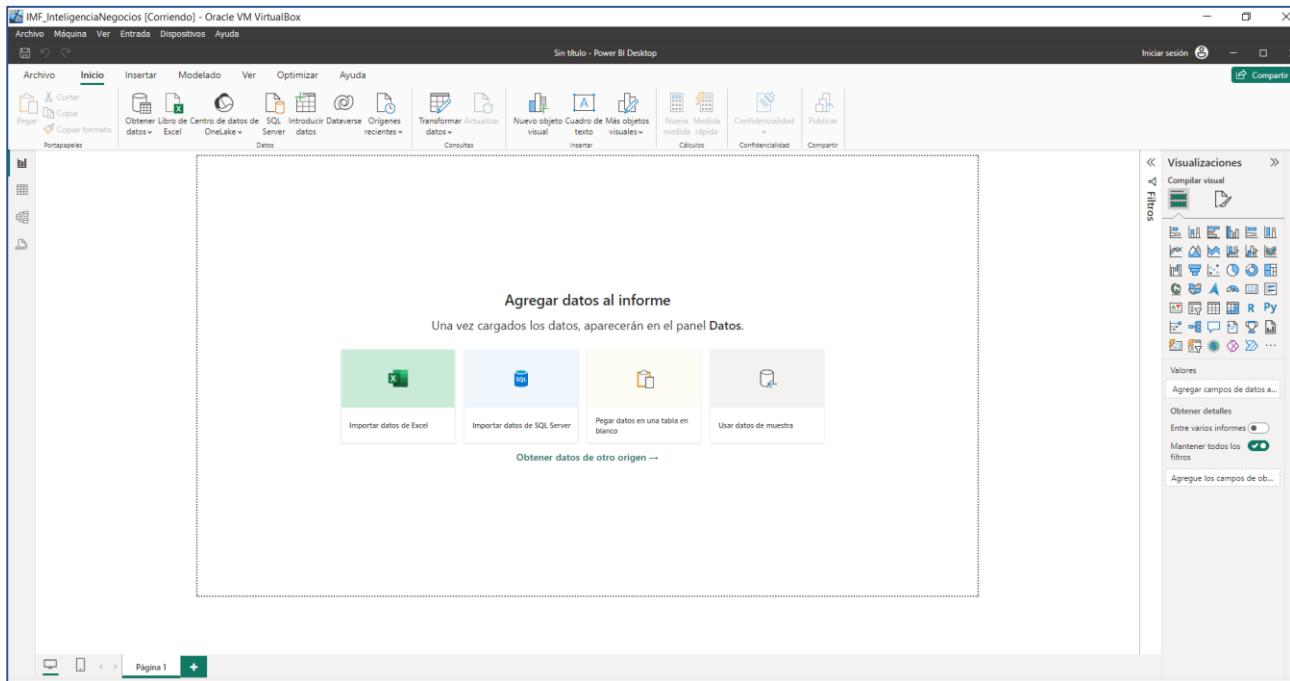
***** Este comando permite : Cuantos paises pertenecen a Income Group*****
SELECT COUNT(ID_METRICA) AS Metricas_sin_Nulos
FROM FACT_WDI
WHERE ID_AÑO = 2000 AND IN_VALUE IS NOT NULL;

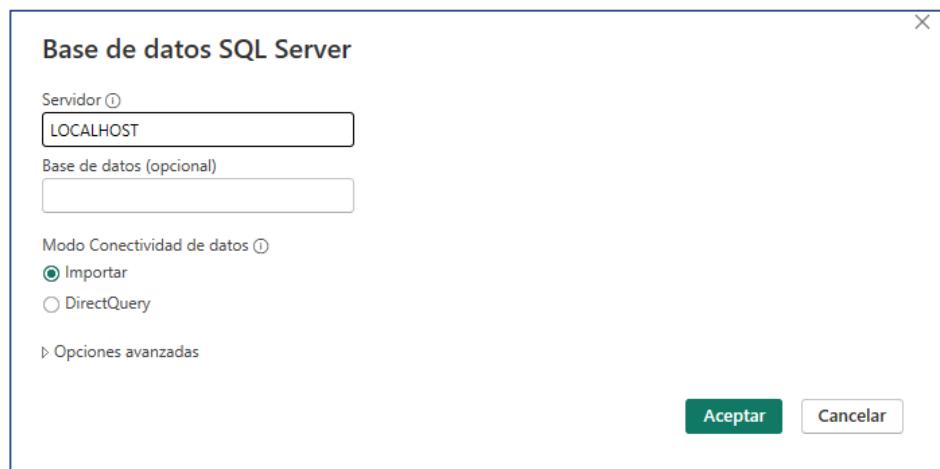
***** Desarrollo de ejercicios de SQL para el curso de Data Analytics. Universidad IMF. Master en Data Science *****
***** MODULO V INTELIGENCIA DE NEGOCIOS Y VISUALIZACION DE DATOS*****
***** Estudiante Richard Douglas Grijalba. Modalidad Virtual *****

```

## Desarrollo Paso a Paso Power Bi.

## Conexión entre Power Bi y SQL Server





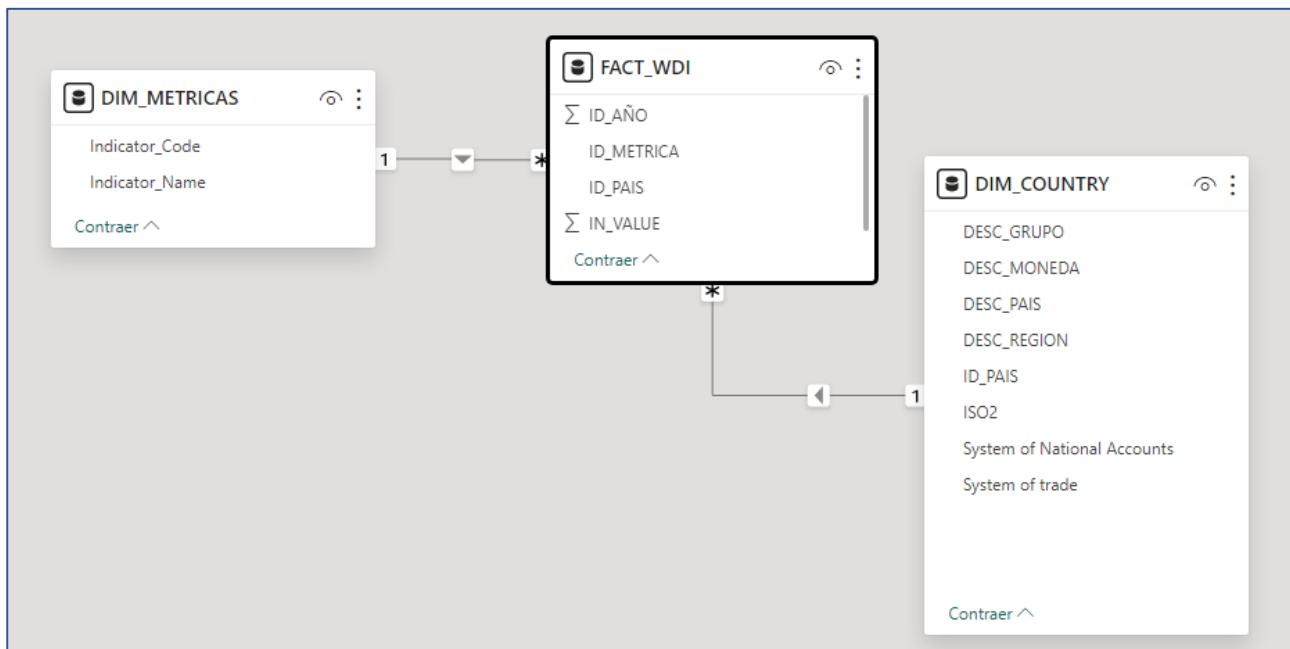
**Navegador**

Opciones de presentación		FACT_WDI
▲	LOCALHOST [7]	
▲	DWH_WWBI [5]	
✓	DIM_COUNTRY	
✓	DIM_METRICAS	
✓	FACT_WDI	
□	sysdiagrams	
□	fn_diagramobjects	

**FACT\_WDI**

ID_PAIS	ID_METRICA	ID_AÑO	IN_VALUE	DIM_COUNTRY	DIM_
AGO	BI.EMP.TOTL.NO	2000	23278	Value	Vt
AGO	BI.EMP.TOTL.NO	2001	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2002	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2003	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2004	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2005	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2006	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2007	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2008	17361	Value	Vt
AGO	BI.EMP.TOTL.NO	2009	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2010	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2011	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2012	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2013	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2014	509107	Value	Vt
AGO	BI.EMP.TOTL.NO	2015	null	Value	Vt
AGO	BI.EMP.TOTL.NO	2016	null	Value	Vt
AGO	BI.PWK.TOTL.NO	2000	6846	Value	Vt
AGO	BI.PWK.TOTL.NO	2001	null	Value	Vt
AGO	BI.PWK.TOTL.NO	2002	null	Value	Vt
AGO	BI.PWK.TOTL.NO	2003	null	Value	Vt
AGO	BI.PWK.TOTL.NO	2004	null	Value	Vt
AGO	BI.PWK.TOTL.NO	2005	null	Value	Vt

## Diagrama relacional en power Bi



## Exploración y Manipulación de los datos

IMF\_InteligenciaNegocios [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

Herramientas de tablas Herramientas de columnas

Nombre: Year\_System\_NatAccount

Tipo de datos: Número entero

Formato: \$ %,###,##0

Resumen: No resumir

Categoría de datos: Sin clasificar

Ordenar por columna: Ordenar

Gруппы de datos: Grupos

Administrador relaciones: Relaciones

Nueva columna: Calculos

System of National Accounts

System of trade

Year\_System\_NatAccount

ID_PAIS	DESC_PAIS	ISO2	DESC_MONEDA	DESC_REGION	DESC_GRUPO	System of National Accounts	System of trade	Year_System_NatAccount
AFG	Afghanistan	AF	Afghan afghani	South Asia	Low income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
BEN	Benin	BJ	West African CFA franc	Sub-Saharan Africa	Low income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
BFA	Burkina Faso	BF	West African CFA franc	Sub-Saharan Africa	Low income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
BGD	Bangladesh	BD	Bangladeshi taka	South Asia	Lower middle income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
BOL	Bolivia	BO	Bolivian Bolíviano	Latin America & Caribbean	Lower middle income	Country uses the 1968 System of National Accounts methodology	General trade system	1968
BTN	Bhutan	BT	Bhutanese ngultrum	South Asia	Lower middle income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
BWA	Botswana	BW	Botswana pula	Sub-Saharan Africa	Upper middle income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
CAF	Central African Republic	CF	Central African CFA franc	Sub-Saharan Africa	Low income	Country uses the 1968 System of National Accounts methodology	General trade system	1968
CAN	Canada	CA	Canadian dollar	North America	High income	Country uses the 2008 System of National Accounts methodology	General trade system	2008
CHL	Chile	CL	Chilean peso	Latin America & Caribbean	High income	Country uses the 2008 System of National Accounts methodology	General trade system	2008
CHN	China	CN	Chinese yuan	East Asia & Pacific	Upper middle income	Country uses the 2008 System of National Accounts methodology	General trade system	2008
COM	Comoros	KM	Comorian franc	Sub-Saharan Africa	Low income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
CPV	Cabo Verde	CV	Cabo Verde escudo	Sub-Saharan Africa	Lower middle income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
CRI	Costa Rica	CR	Costa Rican colon	Latin America & Caribbean	Upper middle income	Country uses the 2008 System of National Accounts methodology	General trade system	2008
DJI	Djibouti	DJ	Djibouti franc	Middle East & North Africa	Lower middle income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
DOM	Dominican Republic	DO	Dominican peso	Latin America & Caribbean	Upper middle income	Country uses the 2008 System of National Accounts methodology	General trade system	2008
EGY	Egypt	EG	Egyptian pound	Middle East & North Africa	Lower middle income	Country uses the 1993 System of National Accounts methodology	General trade system	1993
EST	Estonia	EE	Euro	Europe & Central Asia	High income	Country uses the 2008 System of National Accounts methodology	General trade system	2008

## Gráficos

