YAŞAR UNIVERSITY
Department of Economics

2018-2019 Academic Year Poster Presentations

Economic Crises and their Early Warning Indicators: A Case of Turkey

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INTRODUCTION

According to Er et al (2014), Turkey's economy has seen growth performance of the last twenty-five years reduced. The economy grew by an average of 3.1% in the 1990-2001 period before the 2001 financial crisis. Then, in the period of 2002-2006, the economy entered a rapid growth process and the average annual growth rate increased. It was 7.2% during that period, however it slumped again to 3.3% between 2007-2012.

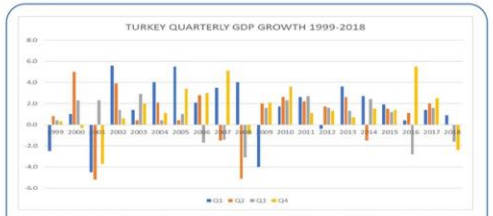
These fluctuations are what led us to choose Turkey as our focus of study since it is the country we currently reside in. This poster will look closely into the methodology and data of the research, and ultimately provide a conclusion onto Turkey's current economic status.

DATA

The data has been categorized into different time lags, with indicators that can predict crises as early as 6 years being highlighted in the colour blue, for 3 years written in red and 1 year time lag in black.

YEARS	CONSUMER PRICE INFLATION (annual %)	GDP(Billion USD)	ACCOUNT BALANCE (% of	yment rate (% of total labor	onal Reserves (million USD)	C CREDIT PROVIDED BY FINANCIA	M2 (BILLIONS TL)	WORLD GDP IN BILLION USD	VALUE ADDED IN BILLION	FDI net Inflows (% of GDP)	FDI net Outflows
1990	60.304	150.676	-1.742	8.015	7.63	19.467	0.071	22.607	72.407	0.454	0.01
1991	65.979	150.028	0.167	8.21	6616	22.476	0.117	23.951	74.546	0.54	0.018
1992	70.076	158.459	-0.615	8.51	7507	24.866	0.19	25.439	79.41	0.533	0.041
1993	66.094	180.17	-3.571	8.96	7846	26.379	0.282	25.853	91.278	0.353	0.031
1994	105.215	130.68	2.013	8.58	8633	25.558	0.63	27.767	63.964	0.465	0.037
1995	89.113	169.486	-1.379	7.64	13890	27.784	1.256	30.871	82.415	0.522	0.061
1996	80.412	181.476	-1.343	6.63	17819	34.121	2.924	31.562	89.691	0.398	0.132
1997	85.669	189.835	-1.39	6.84	19746	34.565	5.658	31.454	97.553	0.424	0.133
1998	84.641	275.769	0.725	6.89	20567	26.816	11.423	31.374	133.771	0.341	0.252
1999	64.867	255.883	-0.361	7.69	24432	35.876	22.401	32.54	133.933	0.306	0.319
2000	54.915	272.98	-3.634	6.49	23514	37.017	31.912	33.598	143.463	0.36	0.248
2001	54.4	200.252	1.878	8.38	19911	51.799	47.241	33.4041	109.603	1.674	0.06
2002	44.964	238.428	-0.263	10.36	28348	46.301	61.879	34.686	127.293	0.454	0.154
2003	21.602	311.823	-2.423	10.54	35548	41.564	82.712	38.926	164.976	0.546	0.193
2004	8.598	404.786	-3.508	10.84	37304	40.007	108.539	43.845	213.881	0.688	0.212
2005	8.179	501.416	-4.184	10.64	52493	43.095	238.801	47.487	264.589	2.001	0.167
2006	9.597	552.487	-5.641	8.72	92336	43.977	297.734	51.446	293.861	3.653	0.312
2007	8.756	675.77	-5.468	8.87	110992	41.177	344.376	57.446	369.267	3.262	0.333
2008	10.444	764.336	-5.158	9.71	116916	52.197	436.38	63.575	422.736	2.597	0.241
2009	6.251	644.64	-1.762	12.55	112226	61.068	493.06	60.267	367.408	1.332	0.192
2010	8.566	771.902	-5.78	10.66	110.01	68.046	587.261	65.966	419.1	1.179	0.285
2011	6.472	832.524	-8.937	8.8	110504	66.651	674.409	73.317	439.549	1.944	0.47
2012	8.892	873.982	-5.488	8.15	137493	67.144	743.043	74.994	469.629	1.573	0.383
2013	7.493	950.579	-6.695	8.73	147880	72.904	908.01	77.099	505.513	1.427	0.755
2014	8.855	934.186	-4.672	9.88	141829	75.323	1015	79.188	501.268	1.404	0.593
2015	7.671	859.797	-3.734	10.24	128052	77.542	1189	74.916	458.344	2.094	0.364
2016	7.775	863.722	-3.837	10.84	129554	80.604	1406	75.997	464.363	1.545	0.317
2017	11.144	851.549	-5.561	11.26	136169	80.843	1516	80.738	453.76	1.278	0.3

YEARS	Terms of Trade	Foreign debt/GDP(%)	Bank Non-performing loans(% of loans)	Stock market Index	Total Reserves (includes gold current billion USD)	Bank liquid reserves to bank assets ratio(%)	TOTAL TAX BURDEN	GROSS NATIONAL SAVINGS(%OF GDP)	Economic Crisis	Gdp Growth(annual %)	Total Debt	Exchange rate	trend
1990	0.851726	33.13335	1.235	32.56	7.626	22.5155	0.006039	20.459	0	9.266	95.49596	0.003	1
1991	0.914775	33.909	1.902	43.69	6.616	23.7739	0.010465	16.979	0	0.72	99.077	0.004	2
1992	0.915303	35.68999	1.359	40.04	7.508	27.1966	0.01786	17.542	0	5.036	110.457	0.007	3
1993	0.726034	38.07793	1.228	206.93	7.846	30.3024	0.029361	18.013	0	7.651	129.3187	0.011	4
1994	1.070414	50.69171	1.788	272.57	8.633	27.9488	0.089984	18.385	1	-4.668	123.7761	0.03	5
1995	0.891989	43.53221	1.197	391.14	13.891	26.3057	0.127975	18.903	0	7.878	134.5265	0.046	6
1996	0.902621	44.42736	0.774	975.89	17.819	15.1661	0.247305	21.156	0	7.38	149.4425	0.081	7
1997	0.878175	44.28688	0.981	2879	19.746	20.3245	0.49995	19.704	0	7.578	168.1556	0.152	8
1998	0.975752	35.15769	4.009	2597.91	20.558	18.2814	0.669292	24.719	1	2.308	180.5616	0.261	9
1999	0.891573	39.77755	4.08	9459.48	24.433	18.6672	1.159974	21.096	1	-3.389	201.784	0.419	10
2000	0.857763	42.78665	4.266	9437.21	23.515	20.6359	1.941791	20.697	0	6.64	116.799	0.625	11
2001	1.193541	56.40193	10.494	13782.76	19.911	23.1158	3.9686	21.893	1	-5.962	112.946	1.226	12
2002	1.052159	54.31451	6.632	10369.92	28.348	16.1547	5.002097	22.704	1	6.43	129.501	1.507	13
2003	0.911799	46.20442	1.411	18625.02	35.549	14.5319	5.40794	21.358	0	5.508	144.076	1.501	14
2004	0.839653	39.43368	0.735	24971.16	37.304	14.038	4.450599	22.587	0	9.644	159.622	1.426	15
2005	0.809537	34.62235	0.499	39377.7	52.494	15.9218	4.265081	23.632	0	9.01	173.602	1.344	16
2006	0.803848	38.19167	0.346	39117.46	63.265	15.296	4.976787	24.715	0	7.11	211.004	1.428	17
2007	0.78717	38.47877	0.405	55538.13	76.496	13.3349	4.523285	23.865	0	5.03	260.028	1.303	18
2008	0.840568	38.01627	0.671	26864.07	73.675	14.2924	4.398825	24.682	1	0.845	608.123	1.302	19
2009	0.944368	43.13772	0.841	52825.02	74.933	12.8445	5.349978	22.233	1	-4.704	603.4521	1.55	20
2010	0.803479	38.97762	0.572	66004.48	85.959	10.8841	5.455628	21.971	0	8.487	666.9976	1.503	21
2011	0.792084	36.64243	0.523	51266.62	87.937	12.9106	6.097338	23.131	0	11.113	657.7142	1.675	22
2012	0.909965	38.76819	0.705	73058.51	119.183	14.0354	6.379559	23.394	0	4.79	682.1883	1.796	23
2013	0.842905	41.03131	0.609	67801.73	131.054	15.4093	6.862533	23.967	0	8.491	702.9466	1.904	24
2014	0.91491	43.46897	0.687	86168.66	127.422	14.9736	7.546987	25.148	0	5.167	700.9475	2.18	25
2015	0.938122	46.51865	0.706	71726.99	110.49	14.6058	9.48639	25.754	0	6.086	651.0869	2.73	26
2016	0.887352	47.35505	0.692	73995.2	105.946	14.4826	10.62845	25.341	0	3.184	684.3015	3.02	27
2017	0.900433	53.39975	0.59	115333	107.657	14.3	12.60331	26.457	0	7.441	454.725	3.64	28



The dependent variable is economic crisis and it has been defined by the quarterly GDP growth of the country. The crisis variable has been given the values of "1" for the years in which the quarterly GDP growth was negative and "O" for the years in which the quarterly growth was positive.

RESULTS

The set of variables that turned out to be the most effective in determining an economic crisis in Turkey were Current Account Balance, Exchange Rate, Foreign Debt to GDP Ratio and Bank Non-performing Loans.

EconomicCrisis	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]
CURRENTACCOUNTBALANCEofGDP	9.373588	6.140222	3.42	0.001	2.5961 33.84467
Exchangerate	1.96e-07	7.94e-07	-3.82	0.000	7.08e-11 .0005448
trend	10.39241	5.942834	4.09	0.000	3.388145 31.87649
BankNonperformingloansofGDP	5.668148	3.028778	3.25	0.001	1.988846 16.15404
_cons	7.61e-08	3.27e-07	-3.81	0.000	1.64e-11 .0003517

Note: _cons estimates baseline odds.
Note: 1 failure and 0 successes completely determined.

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. logistic EconomicCrisis CURRENTACCOUNTBALANCEofGDP Exchangerate ForeigndebtofGDP trend BankNonperformingloansofGDP,
> vce(robust)
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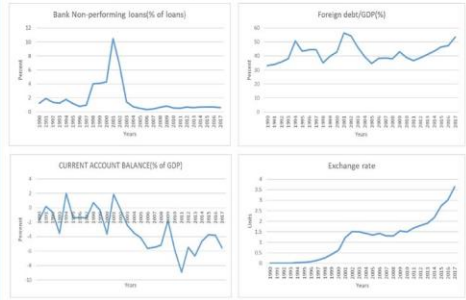
Logistic regression	Number of obs	=	28
	Wald chi2(5)	=	11.92
	Prob > chi2	=	0.0358
Log pseudolikelihood = -3.5905751	Pseudo R2	=	0.7720

EconomicCrisis	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]
CURRENTACCOUNTBALANCEofGDP	94.43156	166.3951	2.58	0.010	2.987031 2985.346
Exchangerate	4.89e-10	4.15e-09	-2.52	0.012	2.85e-17 .0083657
ForeigndebtGDP	.4971411	.1879042	-1.85	0.064	.2370017 1.042817
trend	33.22925	45.33228	2.57	0.010	2.292304 481.6746
BankNonperformingloansofGDP	20.67316	25.20831	2.48	0.013	1.894412 225.6002
_cons	1599.17	13688.36	0.86	0.389	.0000828 3.09e+10

CONCLUSION



The above graphs seem to be showing that Turkey is in a crisis or at the very least is heading for one. When this bubble will erupt is uncertain since the bank non-performing loan indicator hasn't completely spiked yet like it did in the previous years which had crises, and thus it can be deduced that the bubble hasn't burst as of yet.

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DEPARTMENT OF ECONOMICS
SENIOR PROJECT IN ECONOMICS-II

DETERMINANTS OF FEMALE LABOR FORCE PARTICIPATION IN TURKEY

Advisor : Assoc. Prof. Meltem İNCE YENİLMEZ
Arda IŞIK, Merve KESER, Özlem KORKMAZ, Dilek SALĞAR, A. Yavuz Selim TIĞ

Our aim is finding that how female labour force participation rate change over time and which indicators have more effect on female labour force participation rate in Turkey.

Using the OLS method, the effects of the variables on female labor force participation were analyzed between the years 2006-2013 with the annual time series data.

Policy makers should take into account the reforms and policies that will facilitate the inclusion of women in the labor market and ensure their sustainability.

General Equation

Variable	Coefficient	t-stat
Constant	-0,2130	-0,58
PRE	0,0240	0,225
SEC	0,0333	0,754
HIE	0,0206	0,388
UNI	0,0003	0,1102
FER	-0,0003	-0,566
ILF	0,0500	0,675
UN	-1,2990	-0,644
FUN	0,2310	0,391
MUN	1,0310	0,72
MAR	0,5100	3,618*
UNMAR	0,2840	5,254*
DIV	0,0087	0,217
WID	0,0890	0,692
D1	0,1790	0,509
D2	0,0467	0,343
D3	0,3250	-0,587
R2		0,997

Equation II

Variable	Coefficient	t-stat
Constant	0,042	1,082
MAR	0,722	18,79*
UNMAR	0,288	7,964*
R2		0,993

Equation III

Variable	Coefficient	t-stat
Constant	-1,907	-1,257
UN	-1,425	-0,211
FUN	-0,960	-0,454
MUN	2,296	0,496
D1	0,305	0,174
D2	0,725	0,834
D3	2,087	2,153*
R2		0,520

Equation IV

Variable	Coefficient	t-stat
Constant	0,035	0,285
PRE	0,818	13,233*
SEC	0,078	0,938
HIE	-0,007	-0,116
UNI	0,055	0,812
R2		0,943

Equation V

Variable	Coefficient	t-stat
Constant	-0,0506	-0,5679
FER	0,0002	0,2340
MAR	0,9850	26,03*
DIV	0,0120	0,4140
R2		0,973

As a result, the lack of the data did not yield sufficient results statistically. As a result of the estimates, the effect of marital status and primary education of women on female labor force and the effect of 2008 Global Crisis on female labor force participation is statistically significant.

COMPARISON OF INCOME DISTRIBUTION FOR SELECTED COUNTRIES

ŞEYMA GÜRGEN&MUSTAFA TEMUR&SEÇKİN YÜCEL

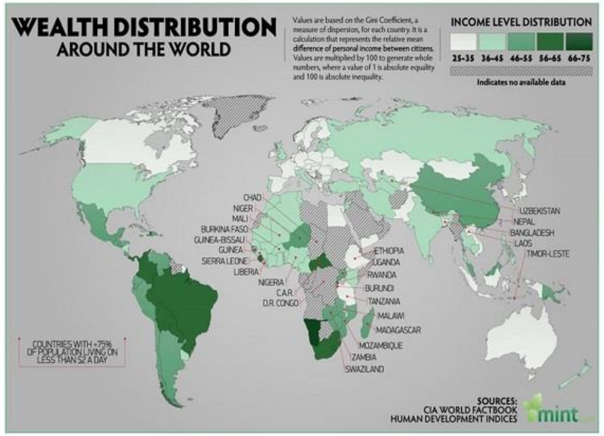
INTRODUCTION

Income distribution is an important indicator for development of a country, because it affects the harmony of society. The impact of growth on poverty reducing and even the health of people

The countries we compare are listed as; US, Brazil,Canada, Turkey, and South Korea. Our purpose of the study is to determine the level of income distribution between those countries and to compare their incoem distribution levels.

WHAT IS INCOME DISTRIBUTION

Income distribution refers to the distribution of the total income derived from the goods and services produced by the individuals living in a country to the individuals in those countries by means of the means of distribution.

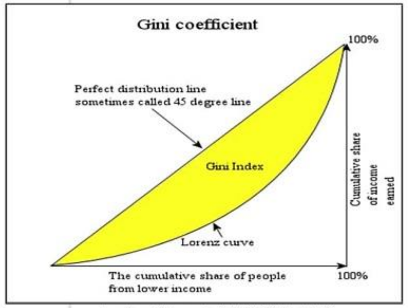


LORENZ CURVE AND GINI COEFFICIENT

The Lorenz curve helps to understand whether income distribution is fair. The Gini coefficient, which is derived from the Lorenz curve, can be used as an indicator of economic development in a country. If the Gini coefficient is 0, income distribute equally. However, as this number reaches 1, income distribution inequality increases

Countries	Ranking	GDP in Current Prices (Billion USD)	Gini Coefficient Values (most recently reported)
USA	1st	20,494.410 $	41.5 (2016)
Brazil	9th	1,868.710 $	51.3 (2015)
Canada	10th	1,711.360 $	34 (2013)
South Korea	12th	1,619.840 $	35.5 (2016)
Turkey	19th	766.163 $	41.9 (2016)

https://knoema.com/nwnfkne/world-gdp-ranking-2018-gdp-by-country-data-and-charts



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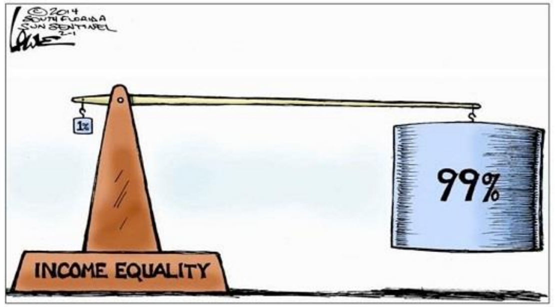
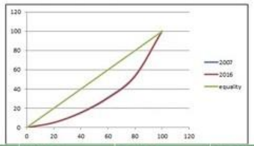


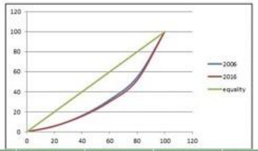
LORENZ CURVES AND GINI COEFFICICENT VALUES OF SELECTED COUNTRIES

USA



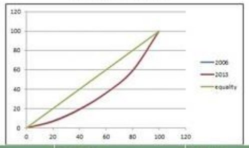
2007	2010	2013	2016
41,1	40,4	41	41,5

TURKEY



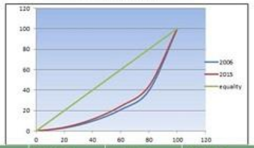
2006	2008	2010	2012	2014	2016
39.6	39	39.8	40.2	41.2	41.9

CANADA



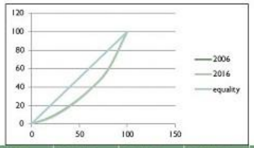
2007	2010	2013
33,8	33,6	34

BRAZIL



2006	2008	2010	2012	2014
39.6	39	39.8	40.2	41.2

SOUTH KOREA



2006	2008	2010	2012	2014	2016
30,6	31,4	31	30,7	-	35,5

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SUPERVISED BY DOC.DR. UMUT HALAÇ

The Position of Turkey's Foreign Trade After 2001 to Present

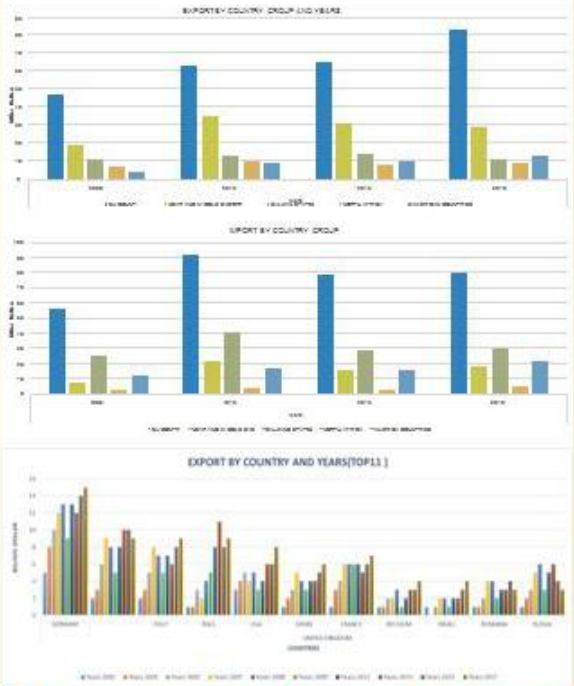
EDA ERĞUN, BATUHAN DURUKAN, TUĞÇE SELET, CEYLİN SANER

ADVISOR: DR. OZDEN BIRKAN

YASAR UNIVERSITY

Export Commodity Composition of Turkey's Trade

Trade Partners of Turkey's Trade



	Levels		1st Difference	
Variables	*ADF*	*P Value*	*ADF*	*P Value*
lnGDP	0.42	0.97	-4.32	0.00
OPEN	-2.16	0.22	-5.52	0.00
GCF	-1.66	0.43	-5.46	0.00
LFP	-0.68	0.83	-1.16	0.66
RD	0.11	0.95	-5.61	0.00
EDU	-0.43	0.88	-4.51	0.00

Levels		
Variables	*ADF*	*P Value*
uhat	-4.84	0.00

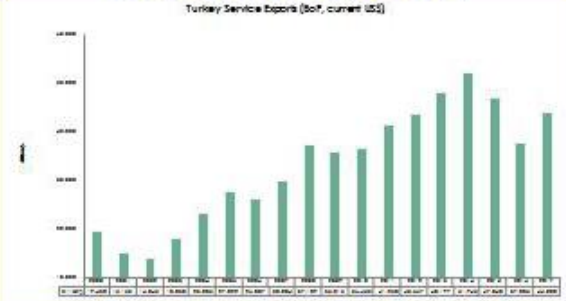
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	25.09885	0.206316	121.6527	0.0000
OPEN	0.019004	0.006240	3.045588	0.0102
GCF	0.038948	0.005851	6.656669	0.0000
LFP	0.006536	0.003731	1.751965	0.1053
RD	0.339245	0.106917	3.172977	0.0080
EDU	0.011233	0.001830	6.136905	0.0001

R-squared	0.995043	Mean dependent var	27.35594
Adjusted R-squared	0.992978	S.D. dependent var	0.282307
S.E. of regression	0.023657	Akaike info criterion	-4.389145
Sum squared resid	0.006716	Schwarz criterion	-4.092354
Log likelihood	45.50230	Hannan-Quinn criter.	-4.348221
F-statistic	481.7903	Durbin-Watson stat	2.074423
Prob(F-statistic)	0.000000		

Conclusion

- Major trends you observed
  - In services
  - Commodities
  - Partners
- Openness is an econometrically significant factor in growth according to our data set.

Service Export of Turkey's Trade



An econometric model of Turkey's GDP Growth

$$LNGDP = f\,(GFC + LFC + RD + EDU + OPENNESS)$$

- GDP: gross domestic product growth
- GFC: gross capital formation as percentage of GDP
- LFC: labor force participation as percentage of population
- RD: research and development expenditure as apercentage of GDP
- EDU: schooling ratio at secondary level
- OPENNESS: trade balance as percentage of GDP

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NATIONAL INNOVATION SYSTEMS : COMPARISON of SOUTH KOREA and TURKEY

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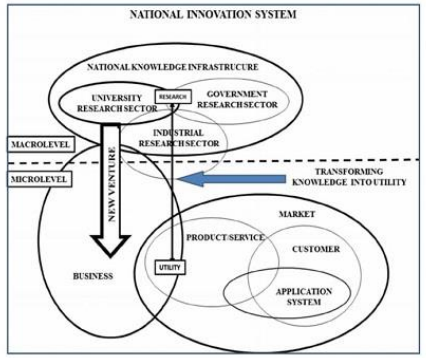
INTRODUCTION



METHODOLOGY

4-step method of Lundvall

1st step

Analyze organizational structure and human resources of firms in consideration of sector specialization.

2nd step

Analyze national and international linkages between firms in the base of knowledge.

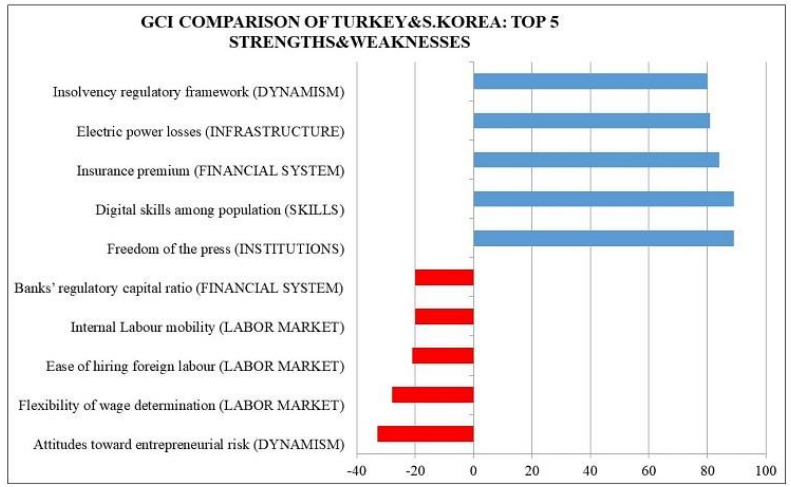
3rd step

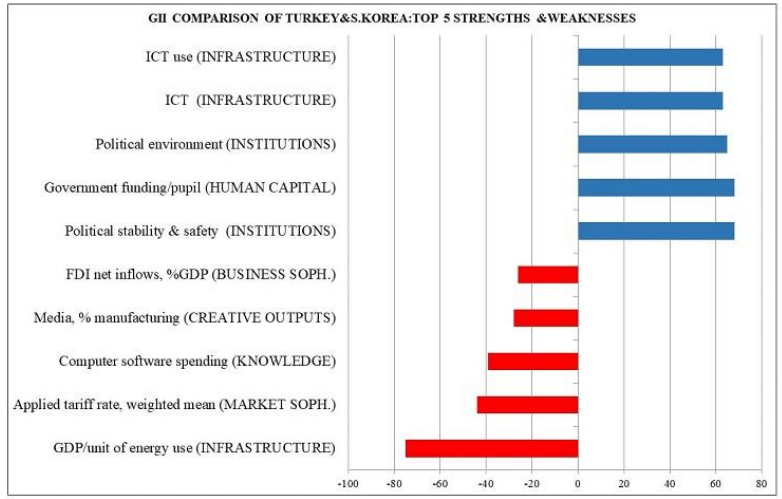
Determine the characteristics of education system, labor market, goods market, financial market, welfare government, intellectual property system which are peculiar to the nation.

4th step

Explain the performance of the NIS

RESULTS





CONCLUSION: TURKEY SWOT

GII TOP STRENGTHS	GII TOP WEAKNESSES
Industrial designs by origin (CREATIVE OUTPUTS)	Political stability & safety (INSTITUTIONS)
Tertiary enrolment, % gross (HUMAN CAPITAL)	ICT services (KNOWLEDGE&TECH. OUTPUTS)
Intensity of local competition (MARKET SOPHIST.)	ICT services imports (BUSINESS SOPHIST.)
Trade, competition, & market scale (MARKET SOPHIST.)	Ease of resolving insolvency (INSTITUTIONS)
Intangible assets (CREATIVE OUTPUTS)	Cost of redundancy dismissal, salary weeks (INSTITUTIONS)

GCI TOP STRENGTHS	GCI TOP WEAKNESSES
Electrification rate (INFRASTRUCTURE)	Terrorism incidence (INTITUTIONS)
Budget transparency (INSTITUTIONS)	Critical thinking in teaching (SKILLS)
Shareholder governance (INSTITUTIONS)	Quality of vocational training (SKILLS)
Gross domestic product (MARKET SIZE)	Freedom of the press (INSTITUTIONS)
Airport connectivity (INFRASTRUCTURE)	Diversity of workforce (INNOVATION CAPABILITY)

OPPORTUNITIES	THREATS
Young population	Lack of innovation, R&D and high tech industries
Geographical location	Terrorism and War
Consumer behavior of community	Inequal income distribution
Climate	Macroeconomic instability
Low labor cost	Infrastructural problems
Globalization	Ineffective education and legal system

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Theoretical Models of Currency Crises in Developing Countries

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ABSTRACT

- Financial crises have been a topic of interest in the financial economics ever since financial liberalization period in the developing countries. The main aim of this research is set on investigating the theoretical currency crises models related to the developing countries , such as Latin America, Mexico and Southeast Asia.The currency crisis phenomenon in these countries was followed by the rapid decline in the value of domestic currencies, high reserve loses and high level of interest rates.

Table.1.Early Warning Indicators and Their Expected Signs

Indicators	Expected Signs	Reference
GDP growth (annual %)	(-)	Obsfeld (1986), (1996)
Current account balance / Reserves	(-)	IMF (1998), Frankel and Rose (1996), Berg and Patillo (1998), Esquivel and Larrin (1998), Cartapanis, Dopsy and Mametz (2002)
Domestic credit provided by banking sector (%of GDP)	(+)	Corsetti, Pesenti and Roubini (1998), Kaminsky and Reinhart (1996), Kaminsky (1998), Sachs, Tornell and Velasco (1996)
Bank liquid reserves to bank assets ratio (%)	(+)	IMF (1998), Rodric and Velasco (1999)
M2 growth (annual %)	(-)	Krugman (1979)
Export (%growth) / Import (%growth)	(-)	Eichengreen, Rose and Wyplosz (1996), Berg and Patillo (1998), Vlaar (2000)
Portfolio investment / Foreign direct investment	(+)	IMF (1998)

Source: Kahraman, S. et al. (2009).

FIRST GENERATION MODELS

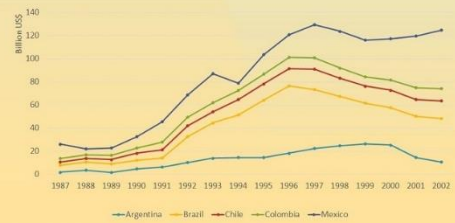
- Made by Paul Krugman (1979) in order to explain the crises surrounding the Latin American countries such as Argentina.
- Financial crises is a result of the increase in budget deficits that causes high loss of international reserves.
- The first-generation currency crisis was criticized for suggestion related to finance of budget deficits in an uncontrolled way.

LATIN AMERICAN CRISIS

- In 1970's Latin America became a center of speculative attacks on domestic currencies and experienced foreign external debt in 1982.
- Sharp declines in equity markets, banking sector problems.
- Lack of transparency and regulation over fiscal policy in Latin American countries.

Graph.1.Latin American Crisis

Total Reserves minus Gold (current US$)



Source: IMF & WB.

SECOND GENERATION MODELS

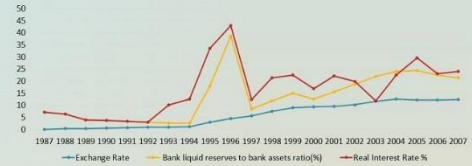
- Evaluates the pessimist expectations in weak macroeconomic conditions. (Obstfeld 1994)
- In case of having uncertainty, the legitimacy of the fixed exchange rate regime is undermined.
- These models are the multiple-equilibria models that Obsfeld put forward in 1986, 1994, 1996 articles.
- Decrease in the rate of return of loans that is followed by the crisis results in the shrink of the real sector size.(Durmus, 2010).

MEXICO CRISIS

- The tequila effect occured due to a sudden devaluation of Peso against US$ (between 13 to 15%) which caused other currencies to decline in the region.
- Decline in international reserves,
- Foreign capital fled which spread in emerging markets,
- High level of USD-denominated debt (Sachs, Tornell, Valesco, 1996).

In response to the crisis, Mexicon government required to implement financial ana monetary policies and let the Mexicon peso float.

Graph.2. Mexico Crisis



Source: IMF & WB.

THIRD GENERATION MODELS

- Developed by Krugman (1997-1998) in order to investigate the theoretical framework related to spread effects of the Asian Crisis.
- Identifies why a currency crisis in one country might trigger a crisis in another and why it can be contagious.
- The increase in the interest rate directly effects the line of credit and hinders the capital investment plan for the firms.

ASIAN CRISES

- Originated from Thailand and spreaded to other Asian countries during 1997. Caused high level of depreciation, collapse of stock markets, capital outflow that spread to the other countries in the area.
- According to Krugman, when the second-generation currency crisis cannot interpret the Asian crisis it can be said that; the crisis countries were stable in terms of macroeconomic fundamentals (Lane, 1999).
- Consequently, these countries were not able to maintain the fixed exchange rate regime. (Krugman, 1999).

TABLE

%Δ Real Exchange Rate

Source: IMF & WB.

CONCLUSIONS

- Most emerging market economies have faced currency crises after the 1980s financial liberalization period. Theoretical currency crises models have developed to explain the reasons of these crises. While first generation models indicate the importance of international reserves, the second generation models emphasize the role of speculative attacks and the third generation models consider the role of contagious effect.
- These experiences show that international reserves, Exchange reates and interest rates remain key variables and they may well reflect financial stability with policy implications.